

# **Exhibit 1**

## **(Filed Under Seal)**

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

IN RE NAMENDA DIRECT PURCHASER  
ANTITRUST LITIGATION

Case No. 1:15-CV-07488-CM-JCF

## Revised Expert Report of

## Professor Einer Elhauge

Einen Change

September 20, 2017

**HIGHLY CONFIDENTIAL: SUBJECT TO PROTECTIVE ORDER**

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### **QUESTIONS ASKED**

1. Plaintiffs' counsel has asked me to use economic analysis of the facts and data of this case to answer the following questions:

- A. Did the reverse payment in this case delay entry?
- B. What settlement entry date would Forest and Mylan have agreed to without the reverse payment?
- C. Was a reverse payment reasonably necessary and the least restrictive means to achieve a settlement between Forest and Mylan in the patent case?
- D. Are there any procompetitive justifications for the reverse payment?

### **EXECUTIVE SUMMARY**

2. I demonstrate how reverse payments can facilitate a form of market division over time by extending the length of exclusion a patent holder enjoys beyond that merited by the patent itself. I then establish that, given estimates of various factors in this case, one can, from the parties' actual settlement, calculate their actual bargaining strength and then use that information to determine that in a no-payment settlement the generic entry date would have been November 2, 2012. Accordingly, the reverse payment made the generic entry date in the actual settlement 26.3 months later than it would have been in a no-payment settlement. (Actual entry was delayed by another 6 months because Forest was able to obtain pediatric exclusivity, which delayed entry by another 6 months.) I further demonstrate that this conclusion that the reverse payment substantially delayed entry is robust to different estimates of patent strength, litigation end date, litigation costs, reverse payment size, and odds of pediatric exclusivity. Finally, I show that the reverse-payment settlement cannot be justified by avoided litigation costs or risk aversion for several reasons, including: that those costs and risks would have been equally avoided by a no-payment settlement; that saved litigation costs would not decrease prices; that the parties were not risk averse; and that any risk aversion would actually increase the entry delay caused by the reverse payment.

### QUALIFICATIONS

3. I am the Petrie Professor of Law at Harvard University, where I teach and write about the economic analysis of antitrust law, health policy, and various other subjects. I am the author of various books, including *U.S. Antitrust Law & Economics*; co-author of *Global Antitrust Law & Economics*, *Global Competition Law & Economics*, and *Areeda, Elhauge & Hovenkamp, Vol X, Antitrust Law*; and editor of *The Research Handbook On The Economics Of Antitrust Law* and *The Fragmentation Of U.S. Health Care*. I am also the author of numerous articles on various topics involving the economic analysis of antitrust and other legal issues, including articles on monopolization, bundled discounts, loyalty discounts, and reverse-payment settlements. My CV (attached as Exhibit A) lists all my publications, including all those in the past ten years. Exhibit B to this report describes my compensation and the cases in which I have testified at trial or in a deposition in the past four years. I am being compensated at a rate of \$1150 per hour for my work on this case, and my consulting firm, Legal Economics LLC, is being compensated \$235-575 per hour for the work of my staff on this report. None of my compensation in this case is contingent upon the outcome of the case or any aspect of the case.

4. I am also President of Legal Economics, LLC, which provides expert witnesses and support work on legal cases. I myself have testified as an expert witness on antitrust economics in dozens of federal cases, and I have been qualified as an expert in antitrust economics by all fifteen of the fifteen courts to rule on that question. I have also served as an expert witness on antitrust economics before Congress, arbitration panels, and competition agencies in the US, EC, Korea, and Brazil. My testimony as an economics expert has spanned a wide range of topics, including reverse-payment settlements, other horizontal agreements, vertical agreements, mergers, monopolization and exclusionary conduct, price discrimination, health economics, patent economics, and contract economics. My clients have included leading corporations, law firms, and the United States government. I have been named one of the world's leading competition economists in the *International Who's Who of Competition Lawyers and Economists*.

5. I am a Member of Advisory Boards for the Journal of Competition Law & Economics, the Social Sciences Research Network on Antitrust Law & Policy, and the Social Sciences Research Network on Telecommunications & Regulated Industries. I have taken courses in economics, statistics, antitrust, and economic analysis of law, and I regularly read and use economic literature on antitrust economics, including books on industrial organization. I also regularly attend

workshops on those and other topics regarding the economic analysis of law. I routinely use and teach economic analysis in my classes, including those that I regularly offer on antitrust law and economics and health law policy.

## I. BACKGROUND

### *A. Settlement Terms*

6. Mylan was one of many generic companies that challenged the patent providing Forest protection for Namenda (a drug used to treat Alzheimer's disease). Forest settled with all of these generic companies, with each settlement providing for a generic launch date of January 11, 2015, absent any extension for pediatric exclusivity or triggering of the contingent launch provision. Specifically, the Final Settlement Agreement, and the License Agreement attached as an Exhibit to the Settlement Agreement, between Forest and Mylan, signed on July 21, 2010, provided that Mylan would not enter the market for Namenda IR (immediate release) until three months "prior to the expiration of the '703 patent, including any extensions and/or pediatric exclusivity."<sup>1</sup> At the time of the settlement agreement, the patent was set to expire on April 11, 2015, meaning that Mylan would not be able to enter until January 11, 2015. This January 11, 2015 settlement entry date represented 93.0% of the time between the expected end of the patent litigation and patent expiration.<sup>2</sup>

7. On June 18, 2014, Forest obtained pediatric exclusivity for Namenda.<sup>3</sup> As a result, by operation of its agreement with Forest, Mylan was prevented from entering with its generic product until July 11, 2015 even though Mylan obtained final FDA approval to launch a generic version of Namenda IR on January 30, 2015.<sup>4</sup> But the forecasts of Forest and Mylan around the time of settlement indicate that, at

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<sup>1</sup> Forest-Mylan Settlement Agreement FRX-AT-00000428 at 447.

<sup>2</sup> Namenda Model v8.xlsm ("Inputs" tab Cell E22).

<sup>3</sup> Forest Obtains Six Months U.S. Pediatric Exclusivity for NAMENDA and NAMENDA XR, Business Wire (June 18, 2014), available at <http://www.businesswire.com/news/home/20140618005438/en/Forest-Obtains-Months-U.S.-Pediatric-Exclusivity-NAMENDA%C2%AE>.

<sup>4</sup> FDA Approved Drug Products, available at <https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=079225> (showing approval date for Mylan's Namenda ANDA to be January 30, 2015).

that time, neither party expected Forest would obtain pediatric exclusivity for Namenda. Forest's most recent pre-settlement forecast of its profits if it could exclude generic entry for the full patent life assume generic entry on the patent expiration date, indicating that, at that time, Forest did not expect to obtain pediatric exclusivity.<sup>5</sup> Mylan's financial projections immediately after the settlement indicate that, at that time, it expected it would be able to enter in January 2015, thus indicating that, at that time, Mylan also did not expect that Forest would obtain pediatric exclusivity.<sup>6</sup> Mylan's pre-settlement forecast also mentions in its product information that there are no pediatric studies of Namenda, indicating it did not anticipate pediatric exclusivity at the time.<sup>7</sup>

8. The contingent launch provision allowed every settling patent defendant to accelerate their launch of generic Namenda IR under certain circumstances, including a litigation victory on the '703 patent by another ANDA filer or if Forest agreed to an earlier entry date with any other ANDA filer. Specifically, each license agreement provided that in the event of a "Final Court Decision"<sup>8</sup> finding the '703 patent invalid or unenforceable, each settling patent defendant could launch on the date of the Final Court Decision.<sup>9</sup> Each license agreement further provided that if any first-to-file ANDA filer received an earlier launch date, then every ANDA filer's launch date would "automatically be amended" to be equivalent to the earliest launch date provided to another ANDA filer.<sup>10</sup>

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<sup>5</sup> FRX-AT-04134771 (September 3, 2009 forecast of Mylan profits under various scenarios, with the full patent life scenario showing generic entry in April, 2015).

<sup>6</sup> MYLMEMA\_003476 (Tab "July 2010" Cell K2 showing a "Mylan launch" date of Jan-15. This is the first tab of the spreadsheet to reflect the settlement agreement).

<sup>7</sup> *Id.* (Tab "June 2010" Cell E62).

<sup>8</sup> Defined as "a decision of a court from which no appeal has been or can be taken, excluding any petition for a writ of certiorari or other proceedings before the United States Supreme Court." See FRX-AT-00000019, §1.11; FRX-AT-00000057, §1.11; FRX-AT-00000094, §1.12; FRX-AT-00000130, §1.8; FRX-AT-00000166, §1.9; FRX-AT-00000202, §1.8; FRX-AT-00000236, §1.10; FRX-AT-00000292, §1.10; FRX-AT-00000322, §1.7; FRX-AT-00000360, §1.7; FRX-AT-00000398, §1.8; FRX-AT-00000447, §1.8; FRX-AT-00000497, §1.10.

<sup>9</sup> Or upon obtaining final FDA approval to market generic Namenda IR, whichever is later. See FRX-AT-00000024, §4.4; FRX-AT-00000057, §4.4; FRX-AT-00000098, §4.4; FRX-AT-00000134, §4.4; FRX-AT-00000169, §4.4; FRX-AT-00000207, §4.5; FRX-AT-00000240, §4.4; FRX-AT-00000295, §4.4; FRX-AT-00000322, §4.4; FRX-AT-00000364-65, §4.5; FRX-AT-00000404, §4.4; FRX-AT-00000451, §4.4; FRX-AT-00000502, §5.2.

<sup>10</sup> Or upon obtaining final FDA approval to market generic Namenda IR, whichever is later. See FRX-AT-00000023, §4.3(a); FRX-AT-00000057, §4.3; FRX-AT-00000098, §4.3; FRX-AT-



9. Each of these settlements also contained payments from Forest to the generic companies. The settlements with all generics other than Mylan provided for payments of between \$500,000 and \$2,000,000 to defray litigation costs.<sup>11</sup> Mylan was the final generic company to settle the patent litigation, and consequently had the ability to provide Forest with patent certainty by agreeing to settle. Because of the contingent entry clauses, if Mylan continued to litigate the patent and won, it could cause many generics to enter the Namenda market, eliminating the vast majority of Forest's brand profits for Namenda. Not surprisingly, Mylan received a much larger reverse payment from Forest. In my analysis, I measure the delay caused only by the reverse-payment settlement with Mylan.

10. The Namenda settlement between Forest and Mylan provided multiple reverse payments from Forest to Mylan. First, Forest agreed to pay Mylan \$2 million as reimbursement in part for already incurred litigation expenses.<sup>12</sup> Second, Forest agreed to amend an existing royalty agreement on an unrelated drug, Lexapro, to provide Mylan with more cash than under the original agreement. This amended Lexapro agreement provided for an immediate \$20 million payment to Mylan.<sup>13</sup> It also gave Mylan an additional \$12.5 million by reducing the royalties that Mylan had to pay Forest for Lexapro from 40%<sup>14</sup> to 30% for the first \$100 million of Product Profit and to 35% for the next \$50 million of Product Profit.<sup>15</sup> This amendment reduced the amount Mylan was required to pay Forest on Lexapro by  $(40\%-30\%)*\$100 \text{ million} + (40\%-35\%)*\$50 \text{ million} = \$12.5 \text{ million}$ , as the Product Profit quickly exceeded the \$150 million threshold required for the amendment to have maximum effect.<sup>16</sup> The upfront payment of \$20 million under the Lexapro

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00000134, §4.3; FRX-AT-00000169-70, §4.3(a); FRX-AT-00000207, §4.3; FRX-AT-00000239-40, §4.3; FRX-AT-00000364, §4.4; FRX-AT-00000403, §4.3(a); FRX-AT-00000450-51, §4.3.

<sup>11</sup> *Id.*

<sup>12</sup> Forest-Mylan Settlement and License Agreement FRX-AT-00000428 at 449 (Forest "shall pay Mylan \$2,000,000 to defray a portion of the paid attorney fees and costs that Mylan has already expended in this Action").

<sup>13</sup> Forest-Mylan Amended Lexapro Agreement FRX-AT-00000464 at 470 ("Forest agrees to pay Mylan US \$20 million within ten (10) business days of the Amendment Effective Date.").

<sup>14</sup> Forest-Mylan Original Lexapro Agreement FRX-00000253 at 261.

<sup>15</sup> Forest-Mylan Amended Lexapro Agreement FRX-AT-00000464 at 470-471.

<sup>16</sup> FRX-AT-04406052 (Q1 2012 Lexapro royalty forecast showing Product Profit of \$142 million in the first quarter of 2012 alone); FRX-AT-04406053 (Q2 2012 Lexapro royalty forecast showing Product Profit of \$112 million in the second quarter of 2012, causing the cumulative Product Profit to exceed \$150 million at some point during the second quarter).

amendment was to be made 60 days after the execution date of the settlement<sup>17</sup> and the \$2 million for litigation expenses were to be paid within 10 days of the settlement.<sup>18</sup> The reduced Lexapro royalties were to be paid within 30 days from the end of the calendar quarter in which they were incurred.<sup>19</sup>

11. The total gross reverse payment amount provided from Forest to Mylan as part of the settlement was therefore \$2.0 million + \$20.0 million + \$12.5 million = \$34.5 million. Mylan projected that there would be \$142.2 million in Product Profit in the first quarter of 2012. It therefore expected its royalty obligation to be reduced by  $(40\%-30\%)*\$100 \text{ million} + (40\%-35%)*\$42.2 \text{ million} = \$12.1 \text{ million}$  in the first quarter of 2012. It expected the remaining \$0.4 million to be paid in the second quarter of 2012. I calculate the present value of these payments using a 10% discount rate, which is what Forest used in forecasting its Namenda profits,<sup>20</sup> and assuming that Mylan expected payments to be made on the last day they were allowed to be made under the settlement agreements. Using this approach, I calculate the present value of the expected payments as of the date of settlement, July 21, 2010 to be \$32.5 million.<sup>21</sup> I also understand that Mylan expected to incur some additional costs as a result of the Lexapro amendment, which Mr. Bruno has estimated to be between \$1.2 million and \$2.0 million, and that Mr. Bruno estimates that the majority of this expense would be incurred a short time after the amendment was signed, with a smaller portion expended over the following three years. To be conservative, I treat these expenses as if they would all have been expended immediately, which maximizes their present value. I deduct the midpoint of this undiscounted range (\$1.6 million) from the present value of the reverse payment to arrive at a net reverse payment amount of \$30.9 million.

### ***B. The Parties' Profit Projections***

12. For my analysis of the but-for settlement the parties would have reached without the reverse payment in July 2010, what is relevant are the parties' expectations at the time of settlement. I therefore use only pre-settlement forecasts in my analysis of the but-for settlement entry date. I use the most recent pre-settlement forecast to determine the parties' expectations at the time of settlement

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<sup>17</sup> Forest-Mylan Settlement Agreement FRX-AT-00000428 at 450.

<sup>18</sup> Forest-Mylan Lexapro Amendment FRX-AT-00000464 at 470.

<sup>19</sup> Original Lexapro Agreement FRX-AT-00000253 at 261.

<sup>20</sup> FRX-AT-04134771.

<sup>21</sup> Namenda Model v6.xlsm ("Rev Pmt Amt" tab)

because that would supersede earlier pre-settlement forecasts. The most recent Mylan pre-settlement forecast that models what would have occurred without any settlement (i.e., with continued litigation) is from June 9, 2010.<sup>22</sup> This is thus the forecast that I use in my analysis of Mylan's expected profits.

13. This forecast shows that, as of June 9, 2010, Mylan expected there to be 11 generic competitors who would all launch at the same time in October 2011 and that the generic price at time of launch would be 1.9% of the brand price at the time of entry, after which the price was expected to decrease by 3% of the generic price per quarter for each of the first three quarters after launch, by 2% per quarter for the next four quarters after launch, and by 1% for each quarter thereafter.<sup>23</sup> The brand price was projected to be \$3.00 per dose at the time of entry.<sup>24</sup> The brand price was projected to be unchanged as a result of entry and to continue its trend of increasing \$0.054 per quarter.<sup>25</sup> Mylan projected that market doses would be 118.51 million per quarter throughout the projection, both before and after entry, and that the generic share of the market would be 60% in the first quarter after launch, 85% in the second quarter, 90% in the third and fourth quarters, and 95% thereafter.<sup>26</sup> Mylan projected that it would obtain a 10% share of the generic market throughout the projection, and that its gross margin would start at 25.1% in the first quarter of launch, before declining steadily to 0% after four years post-launch.<sup>27</sup> Mylan projected it would earn a present value of \$0.6 million in profits throughout the remaining patent term if it entered in October 2011.<sup>28</sup> It projected it would earn a present value of \$0.1 million in profits from selling generic Namenda for three months prior to patent expiration under the actual settlement agreement.<sup>29</sup>

14. Forest's most recent pre-settlement forecast is from September 3, 2009, and shows Forest's expected sales and income for Namenda under a variety of scenarios for fiscal years 2010 through 2017.<sup>30</sup> The forecast depicted five potential generic launch dates corresponding to "Full Patent Life", "3 months off patent life",

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<sup>22</sup> MYLMEMA\_003476 (Tab "June 2010" Cell C8 showing printed on June 9, 2010).

<sup>23</sup> *Id.* at Row 11.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.* at Row 20.

<sup>26</sup> *Id.* at Rows 4 and 17.

<sup>27</sup> *Id.* at Row 56.

<sup>28</sup> Namenda Model v8.xlsm ("Mono and Comp Payoffs" tab Cell C70).

<sup>29</sup> Namenda Model v8.xlsm ("Rev Pmt Stlmt Payoffs" tab Cell C49).

<sup>30</sup> FRX-AT-04134771 and FRX-AT-04134770 (email dated September 3, 2009 attaching the forecast).

“6 months off patent life”, “12 months off patent life”, and “Early Generic” which has entry occurring four years prior to patent expiration, in April 2011.<sup>31</sup> Forest also had an extended release version of Namenda, called Namenda XR, which Forest had not yet launched.<sup>32</sup> Forest expected Namenda XR would receive FDA protection from a generic version of XR for a period of time following its launch.<sup>33</sup> For each of the first four scenarios for the generic IR launch date, the forecast depicted two potential launch timings for the XR version, either April 2010 or one year prior to generic entry. In all four scenarios, Forest forecast that launching XR one year prior to generic entry would be more profitable.<sup>34</sup> For the “Early Generic” scenario with generic launch in April 2011, the forecast depicts one scenario with an April 2010 extended release launch and one scenario without any extended release launch.<sup>35</sup> In this case, Forest forecast higher profits with the extended release launch than without it.<sup>36</sup> Taken together, these scenarios indicate that Forest expected its profits to be highest launching an extended release product 12 months prior to expected generic entry.

15. The scenario corresponding to “Full Patent Life” and extended release launch in April 2014 therefore provides the profits that Forest expected to earn if it was able to maintain its patent for its full life and pursue a profit-maximizing timing of extended release launch. One can determine how much Forest expected to lose from generic competition by comparing the profits it forecast with early generic entry to those it forecast under the “full patent life” scenario. Since Forest’s fiscal

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<sup>31</sup> *Id.*

<sup>32</sup> Forest launched Namenda XR on June 13, 2013. Forest Announces U.S. Availability of New Once-Daily NAMENDA XR, Business Wire (June 13, 2013), available at <http://www.businesswire.com/news/home/20130613005088/en/Forest-Announces-U.S.-Availability-New-Once-Daily-NAMENDA>.

<sup>33</sup> FRX-AT-04611156 (June 22, 2010 analyst report discussing impact of timing of XR launch, noting “FRX’s 3 year marketing exclusivity (starts upon approval)” in addition to any protection provided by not yet issued patents).

<sup>34</sup> FRX-AT-04134771 (Cells M20:M27). The apparent explanation is that Forest expected that switching patients to the extended release version before generic entry occurred would lessen generic erosion once generic entry occurred on the immediate release version, but Forest did not want to launch the extended release version too far ahead of generic entry because the length of time that the XR version would be protected by an FDA stay would change depending on the timing of the XR launch. *See* FRX-AT-04611156 (June 22, 2010 analyst report discussing impact of timing of XR launch, noting “FRX’s 3 year marketing exclusivity (starts upon approval)” in addition to any protection provided by not yet issued patents).

<sup>35</sup> FRX-AT-04134771 at Rows 14-15 and 28-29.

<sup>36</sup> *Id.*

year ends on March 31 of each year, FY12 represents the first year after early generic launch in the Early Generic scenario in which generic launch occurs in April 2011. In that first year, Forest forecast \$234 million in profits with generic competition and \$739 million in profits without generic competition, meaning that it expected its profitability to decline by 68% during the first year of generic competition.<sup>37</sup> In the second year of generic competition, Forest expected profits to be 72% lower with generic competition than without.<sup>38</sup> In the third year of generic competition, Forest expected profits to be 97% lower, and in the fourth year Forest expected profits to be 99% lower.<sup>39</sup>

16. Using the projected impact of generic competition that each of Forest and Mylan projected in their forecasts discussed above, I can calculate how much each of them expected to earn under various scenarios for timing of generic entry. Each of the following figures reflects the present value of profits at the time of settlement. If it was able to maintain its monopoly throughout the remaining patent period, Forest expected to earn a present value of profits from the expected end of the litigation (October 2011) through the end of the remaining patent period of \$2,332.7 million.<sup>40</sup> If it faced generic entry after the expected end of the litigation, Forest expected to earn a present value of profits from that time through the end of the remaining patent period of \$430.7 million.<sup>41</sup> With generic entry on January 11, 2015, the expected entry date under the reverse-payment settlement, Forest expected to earn a present value of \$2,229.7 million between the expected end of the litigation and the end of the remaining patent period.<sup>42</sup> With generic entry on September 12, 2013, the date the patent would expire if the extension were held invalid, Forest expected to earn a present value of \$1,631.9 million between the expected end of the litigation and the end of the remaining patent period.<sup>43</sup> Mylan expected to earn a present value of \$0.6 million if it entered the market following the expected end of the litigation.<sup>44</sup> With entry on January 11, 2015, the expected entry date under the reverse-payment settlement, Mylan expected to earn a present value of \$0.1

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<sup>37</sup> *Id.* at Cell F21 and F28

<sup>38</sup> *Id.* (comparing Cell G21 to Cell G28)

<sup>39</sup> *Id.* (comparing Cell H21 to Cell H28 and Cell I21 to Cell I28).

<sup>40</sup> Namenda Model v8.xlsm (“Mono and Comp Payoffs” Tab Cell C16).

<sup>41</sup> Namenda Model v8.xlsm (“Mono and Comp Payoffs” Tab Cell C34).

<sup>42</sup> Namenda Model v8.xlsm (“Rev Pmt Slmt Payoffs” Tab Cell C32).

<sup>43</sup> Namenda Model v8.xlsm (“Mono and Comp Payoffs” Tab Cell C53).

<sup>44</sup> Namenda Model v8.xlsm (“Mono and Comp Payoffs” Tab Cell C70).

million.<sup>45</sup> With entry on September 12, 2013, Mylan expected to earn a present value of \$0.5 million.<sup>46</sup>

### *C. Expectations Regarding the Patent Litigation*

17. To determine what reasonable parties' expectations would have been regarding the patent litigation at issue in this case, I rely on patent expert Mr. Johnston, who opines that reasonable parties would have expected that Forest had at most a 40% chance of prevailing on the patent merits.<sup>47</sup> He also opines that, even if Forest prevailed on the patent merits, reasonable parties would have expected a 50% chance that a patent extension it had obtained would be determined to have been fraudulently obtained and consequently invalidated.<sup>48</sup>

18. If the patent had been found valid and infringed, and the extension had been upheld, then the patent would have expired April 11, 2015, and the parties would have expected generic entry at that time. If Mylan prevailed on its patent term extension challenge, the patent expiration date would be set to September 12, 2013 or earlier,<sup>49</sup> so if the patent had been found valid and infringed, but the extension had been found to be fraudulently obtained and therefore invalidated, the parties would have expected generic entry by September 12, 2013. This date represented 55.3% of the time between the expected end of the litigation and the full remaining patent period.<sup>50</sup> (As noted above, the parties' projections at the time of settlement did not expect pediatric exclusivity to be granted.<sup>51</sup>)

19. Given the low generic profits Mylan expected to make with entry and large potential damages, and the fact that assuming no at-risk entry conservatively

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<sup>45</sup> Namenda Model v8.xlsm ("Rev Pmt Stmt Payoffs" Tab Cell C49).

<sup>46</sup> Namenda Model v8.xlsm ("Mono and Comp Payoffs" Tab Cell C88).

<sup>47</sup> Johnston Report ¶16a ("In my opinion, a reasonable and competent patent attorney at the time of the settlement of the Namenda Litigation likely would have concluded that overall Mylan had greater than a 60% chance of prevailing and that Forest and Merz had less than a 40% chance of prevailing in the litigation through trial and appeal.").

<sup>48</sup> Johnston Report ¶16b ("In addition and in my opinion, a reasonable and competent patent attorney at the time of settlement of the Namenda Litigation likely would have concluded that Mylan had a 50% chance of prevailing on its patent term extension challenge, which if successful would have resulted in an expiration date for the '703 patent of September 12, 2013 or earlier.")

<sup>49</sup> *Id.*

<sup>50</sup> Namenda Model v8.xlsm ("Inputs" tab Cell E24).

<sup>51</sup> *See supra* at Section I.A.

lowers any entry delay, I assume the parties would have estimated 0% odds that Mylan would enter at risk during the patent litigation. Mr. Johnston estimates that the parties would have expected an appellate decision from the federal circuit some time between July 2011 to November 2011.<sup>52</sup> This range is consistent with Mylan's June 2010 forecast showing that Mylan forecast that, with continued litigation, it would launch on October 1, 2011.<sup>53</sup> I therefore use the October 1, 2011 as the parties' estimate of when they would have expected the patent litigation to end. Accordingly, if the patent had been found invalid or noninfringed, the parties would have expected generic entry at the end of that litigation, on October 1, 2011.

20. Finally, Mr. Johnston estimates that Forest would have expected future litigation costs of \$3.5 million, while Mylan would have expected future litigation costs to be between \$2.5 and \$3.0 million.<sup>54</sup> I use Mr. Johnston's \$3.5 million estimate of Forest's saved litigation costs and the midpoint of his range of expected future litigation costs for Mylan (i.e. \$2.75 million) in my calculations of the but-for entry date under a no-payment settlement in Part III of this report.

21. In Part IV, I perform sensitivity testing on all these estimates and find that my finding of significant delay caused by the reverse payment in this case is robust to alternative estimates of these parameters.

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<sup>52</sup> Johnston Report ¶17 ("a reasonable and competent patent attorney would have estimated that the Court of Appeals for the Federal Circuit would issue its appellate decision between about July 2011 and November 2011").

<sup>53</sup> MYLMEMA\_003476 (Tab "June 2010" Cell K2 showing Mylan Launch of Oct-11).

<sup>54</sup> Johnston Report ¶18 ("In my opinion, a reasonable and competent patent attorney at the time of the settlement of the Namenda Litigation likely would have estimated Forest and Merz's costs savings for settling the Namenda Litigation with the last litigant, Mylan, to be about \$3,500,000, if tried and appealed. In addition, a reasonable and competent patent attorney at the time of the settlement of the Namenda Litigation likely would have estimated Mylan's costs savings for settling the Namenda Litigation to be about \$2,500,000 to \$3,000,000, if tried and appealed.").



***D. Summary of Model Parameter Estimates***

22. In Table 1 below, I summarize the parameters used in my calculations throughout this report:

<b>Table 1: Summary of Parameters</b>	
<b>Description</b>	<b>Value</b>
Present value of net cost of the reverse payment paid	\$30.9 million
Expected date of generic entry if Mylan continued and won the patent litigation	October 1, 2011
Expected Odds of Pediatric Exclusivity	0%
Entry date agreed to in actual settlement, expressed as percentage of the patent term after the expected end of the litigation	93.0%
Patent expiration date if extension invalidated, expressed as percentage of remaining patent term after the expected end of the litigation	55.3%
Present value of Forest monopoly profits if able to maintain its monopoly throughout the remaining patent period	\$2,332.7 million
Present value of Forest competitive profits with generic entry after litigation	\$430.7 million
Present value of Forest profits with entry at the settlement entry date	\$2,229.7 million
Present value of Forest profits with entry at the original patent expiration date	\$1,633.3 million
Present value of Mylan profits with generic entry after litigation	\$0.6 million
Present value of Mylan profits with entry at the settlement entry date	\$0.1 million
Present value of Mylan profits with entry at the original patent expiration date	\$0.5 million
Perceived likelihood the patent would be upheld as valid and infringed	40%
Perceived likelihood the patent extension would be found fraudulent	50%
Mylan's anticipated future litigation costs at the time of settlement	\$2.75 million
Forest's anticipated future litigation costs at the time of settlement	\$3.5 million



## II. ECONOMICS OF REVERSE PAYMENTS

### *A. Reverse Payments Can Anticompetitively Harm Consumers by Dividing Markets over Time*

23. Reverse-payment settlements that delay competitive entry raise complicated issues because they involve an agreement to divide a market over time in exchange for a transfer payment. A transfer payment is a transfer of value from one entity to another.<sup>55</sup> To make those complications more understandable, I will introduce the underlying concepts one at a time. First, I explain how classic territorial market divisions, whereby each firm agrees not to compete in the other's territory, create anticompetitive profits and split them between the firms along territorial lines. Second, I explain how territorial market divisions can instead involve an agreement by one firm not to compete in an area, in exchange for transfer payments that allow the non-competing firm to share the anticompetitive profits the other firm gets in that area. Third, I explain how firms can divide a market over time by agreeing to delay entry in a way that creates anticompetitive profits that are split using transfer payments. Fourth, I explain how reverse-payment settlements can divide markets over time by delaying entry beyond what would otherwise be expected in a way that creates anticompetitive profits that are split using the reverse payment.

24. To explain these concepts, consider the following simplified situation: Firm A has been the only firm making a certain drug in the United States. Firm B plans to enter the market and compete with Firm A throughout the United States. Firm A would get \$10 billion in profits if Firm B stays out of the market, whereas if Firms A and B compete with each other, prices would decrease substantially and each firm would only get \$1 billion in profits. If Firms A and B could agree not to compete and split the profits from maintaining a monopoly in the market, they would each be better off because their joint profits are much higher without competition (\$10 billion) than with competition (\$2 billion). But their anticompetitive profits would come at the expense of consumers who have to pay \$8 billion more for the

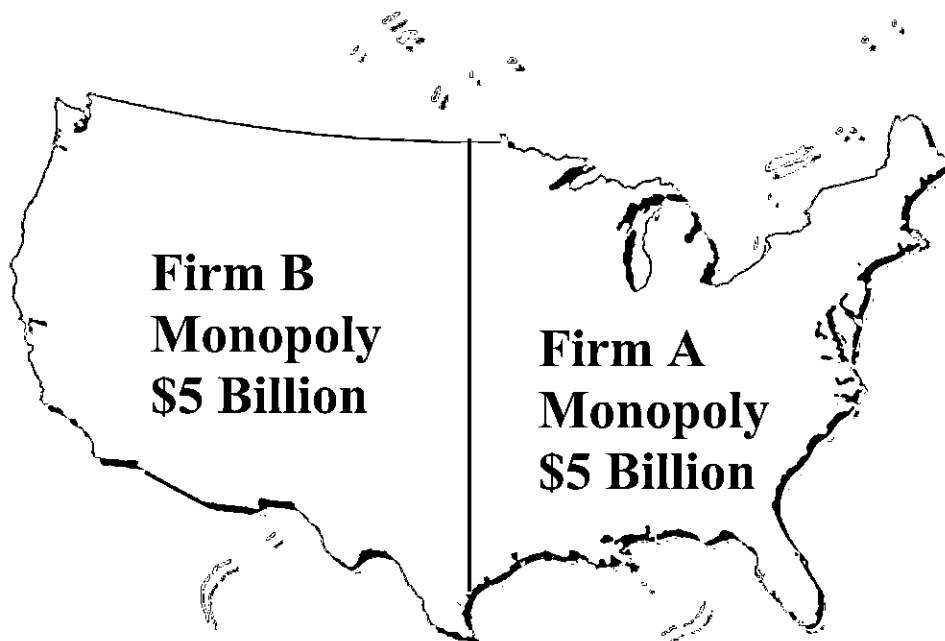
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<sup>55</sup> While transfer payments are often in cash, they can also take many noncash forms. Transfer payments can also, whether in cash or not, be exchanged for return consideration that might itself come in cash or noncash forms. The amount of a transfer payment equals the net value of what is transferred to the entrant: that is, the value of any goods, services, business agreements, or cash payments given to the entrant minus the value of any goods, services, business agreements, or cash payments (such as royalties) the entrant provides in return.

drug due to such an agreement. There are several ways Firms A and B might agree to anticompetitively divide the market to create and split monopoly profits.

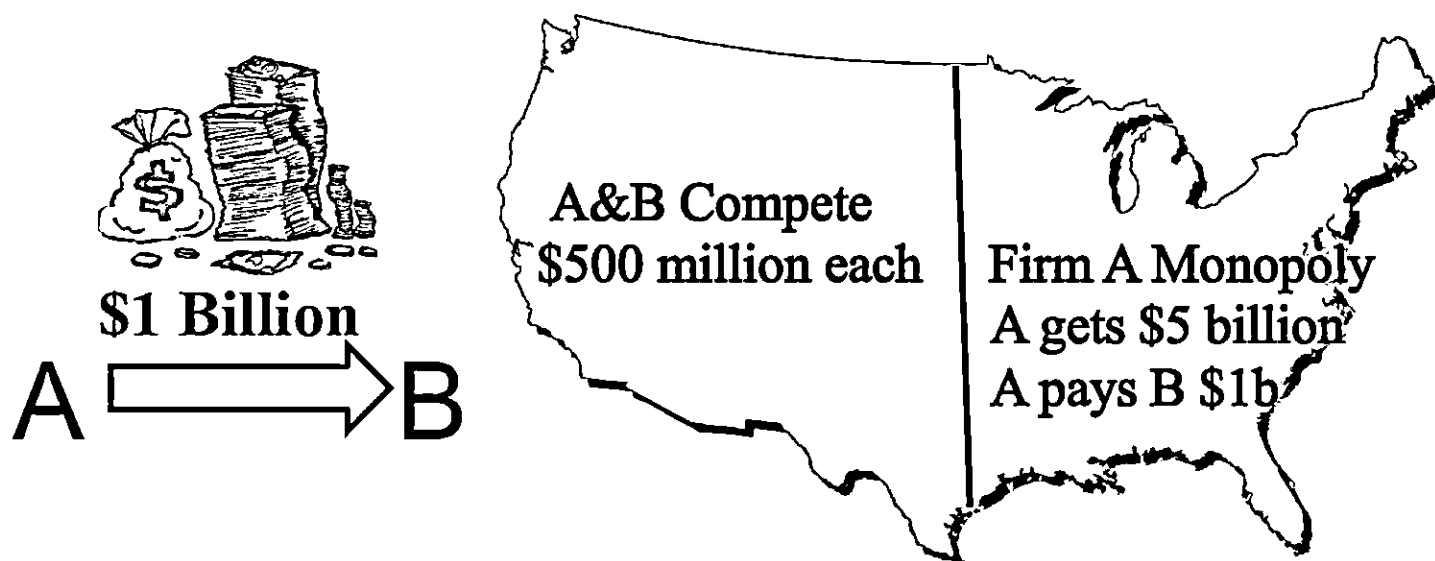
25. **1. Classic territorial market division.** A classic territorial market division would be created if the firms agree that Firm A will stop selling in the Western U.S. in exchange for entering Firm B agreeing not to compete in the Eastern U.S. In this example, Firm A continues to make monopoly profits in the East, while Firm B makes monopoly profits in the West. If the two regions are equally profitable, then each firm would get \$5 billion with this market division, which is substantially more than the \$1 billion they would each have earned if they competed across the entire nation. The \$8 billion in anticompetitive profits would thus be split between them along territorial lines, with each extracting \$4 billion in additional anticompetitive profits in its territory. These additional profits come entirely from the higher prices that the firms are able to charge customers because of their market division agreement. Consumers are harmed even though the market division does not increase prices above the monopoly levels that prevailed before Firm B could have entered. The harm to consumers is that the market division prevents a competitive price drop that would otherwise occur. This example of geographic market division is illustrated below in Figure 1.

**Figure 1. Classic Territorial Market Division Where the Territorial Lines Split the Anticompetitive Profits**



26. **2. Territorial market division with transfer payment.** A territorial market division can instead involve an agreement by one firm not to compete in the territory of the other firm in exchange for a transfer payment. For example, suppose the firms agreed that Firm B will not enter the East if Firm A pays Firm B \$1 billion. However, Firms A and B will compete in the West. This example of geographic market division is illustrated below in Figure 2.

**Figure 2. Territorial Market Division Where a Transfer Payment Splits the Anticompetitive Profits**



27. In this case, Firm A would get \$4.5 billion with the agreement because it would get \$5 billion in monopoly profits in the East and earn \$500 million from competing in the West, and it would have to pay Firm B \$1 billion. Firm B would get \$1.5 billion with the agreement because it would earn \$500 million from competing in the West and receive a \$1 billion payment from Firm A. Without the agreement, Firms A and B would each have made \$1 billion from competing throughout the nation. Thus, the agreement gives Firm A \$3.5 billion in anticompetitive profits and Firm B \$500 million in anticompetitive profits. Consumers are harmed by \$4 billion even though the market division does not increase prices above the past monopoly levels, because the market division prevents a competitive price drop in the East that would otherwise occur.

28. **3. Temporal market division with transfer payment.** Temporal market divisions instead involve an agreement by one firm not to compete with the other firm during a certain time period. For example, consider the time period from 2005 to 2015, and suppose 2005 was the year in which Firm B planned to enter the

market. The firms agree that Firm B will not enter until 2010 if Firm A pays Firm B \$1 billion. Suppose further that Firm A would reap \$1 billion in monopoly profits for each year that Firm B stays out of the market, and that each firm would earn \$100 million per year if they competed and charged competitive prices.

29. In this case, Firm A would get \$4.5 billion with the agreement because it would get \$5 billion in monopoly profits from 2005 to 2010 and earn \$500 million in competitive profits from 2010 to 2015, and would have to pay Firm B \$1 billion. Firm B would get \$1.5 billion with the agreement because it would earn \$500 million in competitive profits from 2010 to 2015 and would receive a \$1 billion payment from Firm A. Without the agreement, Firms A and B would each have earned \$1 billion from competing from 2005 to 2015. Thus, just like the prior territorial market division, this temporal market division gives Firm A \$3.5 billion in anticompetitive profits and Firm B \$500 million in anticompetitive profits. Consumers are harmed by \$4 billion, even though the market division does not increase prices above the past monopoly levels, because the market division prevents a competitive price drop that otherwise would have occurred from 2005 to 2010. This example of temporal market division is illustrated below in Figure 3.

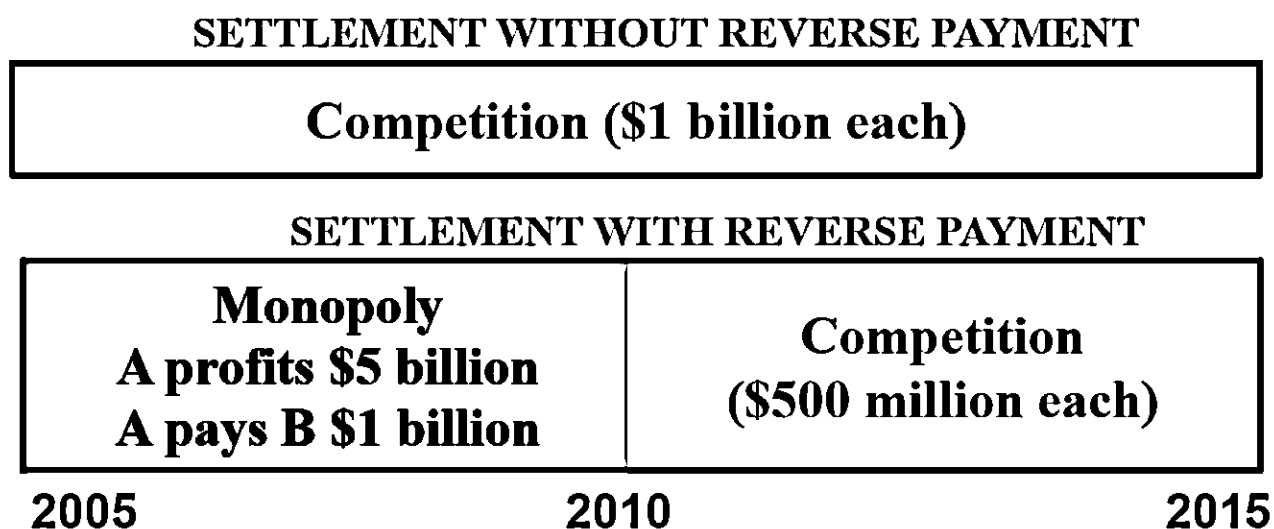
**Figure 3. Temporal Market Division with Transfer Payment to Split the Anticompetitive Profits**

<b>WITHOUT AGREEMENT</b>		
<b>Competition (\$1 billion each)</b>		
<b>WITH AGREEMENT</b>		
<b>Monopoly</b> <b>A profits \$5 billion</b> <b>A pays B \$1 billion</b>		<b>Competition</b> <b>(\$500 million each)</b>
<b>2005</b>	<b>2010</b>	<b>2015</b>

30. 4. Temporal market division from a reverse-payment patent settlement that delays entry. Suppose that Firms A and B have the same potential monopoly and competitive profits as in the last example. Firm A has a patent with 10 years remaining that has only a 10% chance of being held valid. On the eve of a 2004 trial that alleges Firm B would infringe the patent, the parties agree to a

settlement whereby the patent claims are dismissed and Firm B agrees to enter at some point in the future. Suppose further that, without any reverse payment, the settlement would reflect the patent merits by providing that Firm B would enter in one year, in 2005. Instead, Firm A agrees to a reverse-payment settlement in which Firm A pays Firm B \$1 billion and Firm B agrees not to enter until 2010. Firm A would get \$4.5 billion with the reverse-payment settlement because it would get \$5 billion in monopoly profits from 2005 to 2010 and earn \$500 million in competitive profits from 2010 to 2015, and would have to pay Firm B \$1 billion. Firm B would get \$1.5 billion with the reverse-payment settlement because it would earn \$500 million in competitive profits from 2010 to 2015 and receive a \$1 billion payment from Firm A. With a no-payment settlement, Firms A and B would each have earned \$1 billion from competing from 2005 to 2015. Thus, just like the prior temporal market division without a patent, this temporal market division from a reverse-payment settlement gives Firm A \$3.5 billion in anticompetitive profits and Firm B \$500 million in anticompetitive profits. Consumers are harmed by \$4 billion, even though the market division does not increase prices above the past monopoly levels, because the market division prevents a competitive price drop that would otherwise have occurred from 2005 to 2010. This example is illustrated below in Figure 4.

**Figure 4. Temporal Market Division from Reverse Payment Patent Settlement That Delays Entry**



31. In addition to showing the conceptual connection between market divisions and reverse-payment patent settlements that delay entry, these examples have a few general lessons. First, market divisions between an incumbent monopoly firm and a potential entrant, whether geographic or temporal, impose anticompetitive harm on consumers even when they do not cause prices to increase above past levels.

The anticompetitive harm is that they prevent a price drop that competition otherwise would have created in the areas or time periods in which the entrant agrees not to compete. For a geographic market division, the larger the area where monopoly is extended by preventing competitive entry into that territory, the larger the consumer harm. For temporal market division, the longer the monopoly is extended by delaying competitive entry into the market, the larger the consumer harm.

32. Second, market divisions, whether geographic or temporal, are anticompetitive even though they make both of the firms better off. Their anticompetitive harm is that they prevent the firms from competing with each other in some areas or time periods, which benefits them but harms consumers. Even if the monopoly is extended for only one firm, in only one area or time period, both firms can always profit from the market division by using transfer payments to split the anticompetitive profits. The market division will make both firms better off so long as the transfer payment amount is less than the anticompetitive profits received by the extended monopolist but larger than the profits the entrant could make by competing in the restrained areas or time periods.

33. Third, the anticompetitive harm created by market division agreements does not turn on whether we call the agreement a contract, a conspiracy, or a settlement. The anticompetitive harm flows from the fact that, whatever their agreement is called, it involves an agreement by the firms not to compete in some areas or time periods.

34. As I will show, although the numbers are different and more complicated, this case is a version of the fourth example, a temporal market division from a reverse-payment patent settlement that delayed entry by a potential entrant. The incumbent monopolist, Forest, gave the potential entrant, Mylan, \$30.9 million. In exchange, Mylan agreed not to enter until January 11, 2015, thus allowing Forest to extend its monopoly until then. As I will show, this reverse-payment settlement delayed Mylan's entry into this market by 26.3 months, thereby creating anticompetitive profits that harmed consumers for this length of time. To explain how I determine that the reverse-payment settlement delayed entry by this amount of time, I must first explain why the probabilistic nature of issued patents means that entry can be expected to occur before the end of the nominal patent term. I address that issue next.

### ***B. Why Entry Can Be Expected Despite an Issued Patent***

35. The fact that the Patent and Trademark Office (PTO) has issued a patent does not mean the patent will ultimately be held valid and infringed when contested in a court of law. Empirically, many issued patents are not upheld by the courts.<sup>56</sup> This empirical reality could reflect the fact that the PTO issues patents based on the filings of only the patent applicant, whereas courts use an adversarial process that allows excluded rivals to contest issued patents and raise non-infringement defenses that cannot be raised before the PTO. Or it could reflect the fact that, as economic studies indicate, the PTO has incentives to grant too many invalid patents because doing so saves the PTO scarce time on patent examinations and gains the PTO fees on the issuance and maintenance of patents.<sup>57</sup> Whatever the underlying cause, the reality is that there is a significant probability that a PTO-issued patent will not be held valid and infringed by a potential entrant.

36. Accordingly, modern economic literature now recognizes that, until issues of validity and infringement are resolved in litigation, a PTO-issued patent is a “probabilistic” property right. Thus:

the patent holder is not “entitled” to obtain the same level of profits, or the same rights to exclude rivals, as would the owner of the fictionalized ironclad patent. Therefore, the patent holder is not “entitled” to negotiate a monopoly outcome, just because the patent holder asserts that its patent is valid and infringed by a particular rival. Rather, the patent holder’s rights are calibrated according to the likelihood that the patent holder would win the patent litigation, and the extent of exclusion that such a victory would permit.<sup>58</sup>

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<sup>56</sup> See Federal Trade Commission, *GENERIC DRUG ENTRY PRIOR TO PATENT EXPIRATION: AN FTC STUDY*, at vi (2002), available at: [https://www.ftc.gov/sites/default/files/documents/reports/generic-drug-entry-prior-patent-expiration-ftc-study/genericdrugstudy\\_0.pdf](https://www.ftc.gov/sites/default/files/documents/reports/generic-drug-entry-prior-patent-expiration-ftc-study/genericdrugstudy_0.pdf) (“Generic applicants have prevailed in 73 percent of the cases in which a court has resolved the patent dispute.”).

<sup>57</sup> Frakes & Wasserman, *Does Agency Funding Affect Decisionmaking?: An Empirical Assessment of the PTO’s Granting Patterns*, 66 VAND. L. REV. 67 (2013); Frakes & Wasserman, *The Failed Promise of User Fees: Empirical Evidence from the U.S. Patent and Trademark Office*, 11 J. EMPIRICAL LEGAL STUD. 4 (2014); Frakes & Wasserman, *Does the U.S. Patent and Trademark Office Grant Too Many Bad Patents?: Evidence from a Quasi-Experiment*, 67 STAN. L. REV. 613 (2015); Frakes & Wasserman, *Is the Time Allocated to Review Patent Applications Inducing Examiners to Grant Invalid Patents?: Evidence from Micro-Level Application Data*, REV. ECON. STAT. (forthcoming, 2016).

<sup>58</sup> Carl Shapiro, *Antitrust Limits to Patent Settlements*, 34 RAND J. ECON. 391, 395 (2003).



In other words, the PTO's issuance of a patent does not grant its holder an absolute right to exclude competitors, but merely a probabilistic one, which can be tested through litigation.<sup>59</sup>

37. Because a PTO-issued patent is a probabilistic property right, generic entry can be expected during the patent term with some probability for two reasons. First, because there is some probability that the generic will win the patent litigation, entry will occur with that probability after the patent litigation. Second, the probability that the generic will lose can be low enough that the patent damages a generic expects to pay from entering during litigation can be lower than the profits from such entry. In such cases, the generic can be expected to enter during the patent litigation, which is often called “at risk” entry because the generic enters despite some risk it might have to pay patent infringement damages as a result. For both reasons, the expected entry date thus turns on the odds that the patent will be held valid and infringed.

### *C. The Expected Rival Exclusion Merited by the Patent*

38. Because of the probabilistic nature of issued patents, assessing the effects of a reverse-payment settlement thus requires inquiry into what the expected result would have been without such a settlement. To understand the meaning of an expected value, take the following example. Suppose you have 10 lottery tickets. Each lottery ticket has a 1 in 10 odds of winning \$10. On average, you should expect to win once, so the 10 lottery tickets have an expected value of \$10. Thus, the “expected” value of one lottery ticket is \$1. To express this mathematically, the expected value = (odds of winning) x (gains if win). Thus, here the expected value =  $(1/10) \times (\$10) = \$1$ . We can also express any odds as probability. For example, 1 in 10 odds is the same as a 10% probability of winning. Thus, the expected value of a lottery ticket is 10% of \$10 = \$1.

39. The concept of expected value can also be used to determine a patent's expected exclusion of rivals. Suppose that a patent has a 10% chance of being upheld, in which case it will exclude competitors for the remaining patent term of

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<sup>59</sup> See Lemley & Shapiro, *Probabilistic Patents*, 19 J. ECON. PERSPECTIVES 75 (2005); Carl Shapiro, *Antitrust Limits to Patent Settlements*, 34 RAND J. ECON. 391, 395 (2003) (“[n]othing in the patent grant guarantees that the patent will be declared valid, or that the defendant in the patent suit will be found to have infringed. In other words, all real patents are less strong than the idealized patent grant usually imagined in economic theory.”).



10 years. If the patent litigation were instantaneous, the expected rival exclusion would be  $(1/10) \times (10 \text{ years}) = 1 \text{ year}$ .

40. Of course, real litigation is not instantaneous, which introduces another complication: the expected rival exclusion also turns on the expected length of that litigation and on whether the entrant is likely to enter during the patent litigation. Suppose the patent litigation is expected to last two more years and that, if the patent holder wins, it will exclude competitors for the next ten years after the end of the litigation, reflecting a total remaining patent term of 12 years. If the entrant would enter during litigation, then competition will occur during the first two years of litigation with certainty and rival exclusion will occur during the next ten years with 10% odds. Thus, the expected rival exclusion is 1 year. If the entrant would not enter during litigation, then competition will also fail to occur during the two years of litigation. Thus, in this case, the expected rival exclusion would be 3 years. Figure 5 below illustrates the expected exclusion with and without entry during the patent litigation.

**Figure 5. Expected Rival Exclusion Given Patent Litigation Length**

**WITH ENTRY DURING LITIGATION**

<b>Competition During Litigation</b>	<b>Expected Exclusion After Litigation</b>	<b>Expected Competition After Litigation</b>
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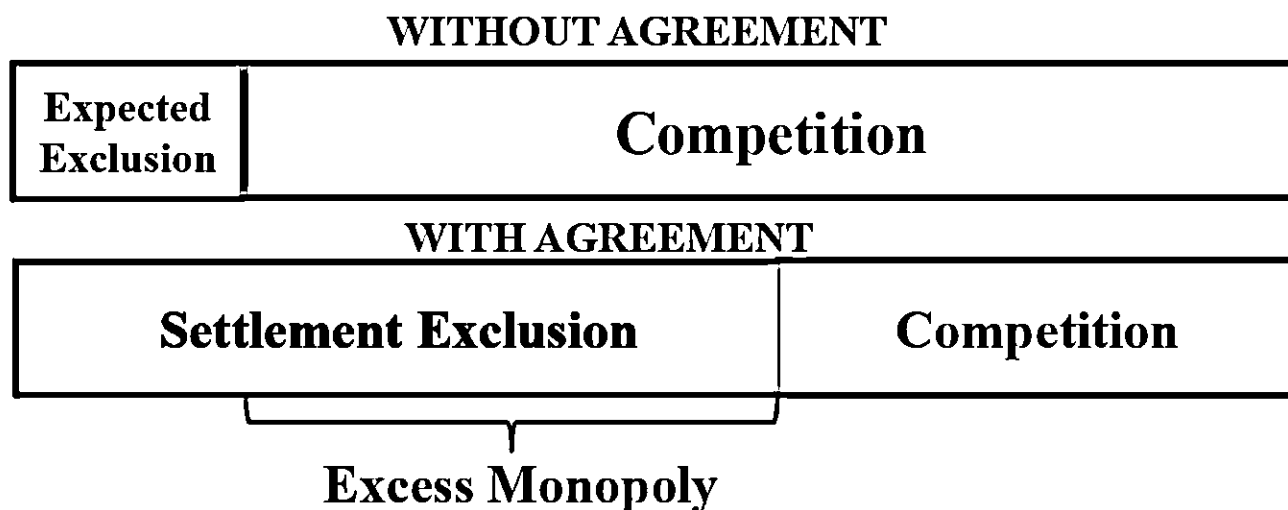
**WITHOUT ENTRY DURING LITIGATION**

<b>Exclusion During Litigation</b>	<b>Expected Exclusion After Litigation</b>	<b>Expected Competition After Litigation</b>
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***D. How to Determine Whether the Reverse-Payment Settlement Excludes Competition for Longer than the Expected Rival Exclusion***

41. A reverse-payment settlement that excludes entry for longer than the expected rival exclusion<sup>60</sup> prevents competition for longer than deserved by the patent merits and divides the market over time in a way that keeps prices from falling and harms consumers. For example, suppose the expected rival exclusion is 1 year. The incumbent monopolist agrees to pay the entrant \$1 billion in exchange for their agreeing not to enter for 6 years. Such a settlement excludes competition for 5 years longer than the expected rival exclusion that was merited by the patent. This is illustrated by Figure 6.

**Figure 6. How Reverse-Payment Settlements Can Exclude Competition for Longer than Expected from Patent Merits**



42. The size of a reverse payment can be used to determine whether the settlement exclusion exceeded the exclusion expected from litigation. As I show in the next Section, a reverse payment is large enough to anticompetitively delay entry whenever the payment amount exceeds the litigation costs the patent holder avoided by settling.<sup>61</sup> This method does not require any estimate of the patent strength, so it

<sup>60</sup> As I show in the following Section, reverse-payment settlements exclude entry for longer than expected rival exclusion whenever the reverse payment amounts are larger than the patent holder's avoided litigation costs.

<sup>61</sup> The converse of this statement is not true. A reverse payment that is less than avoided litigation costs does not mean that the settlement did not cause excess exclusion. It simply means that, when the reverse payment is less than avoided litigation costs, excess exclusion cannot be inferred from the reverse payment size alone.

is especially useful when the patent strength is disputed. It also holds regardless of litigation length, at-risk entry, or the business profits the patent holder or entrant would make with and without entry. Increasing the reverse payment size increases the length of time by which the settlement exclusion exceeds the exclusion expected from litigation.

***E. Reverse Payments Are Large Enough to Anticompetitively Delay Entry Whenever They Exceed the Patent Holder's Avoided Litigation Costs***

43. A reverse payment that exceeds the litigation costs the patent holder avoids by settling is always large enough to anticompetitively delay entry. Elsewhere, I have provided a proof that details all the payoffs with and without entry during the patent litigation.<sup>62</sup> But the point can also be proven more simply. A patent holder can always litigate rather than settle, so it will never accept a settlement unless the profits from doing so leave it better off than the expected result with litigation. With a reverse-payment settlement, the patent holder gets the profits from the settlement exclusion minus the reverse payment. With litigation, the patent holder gets the profits from expected litigation exclusion plus expected damages (if the entrant enters during litigation) minus the litigation costs it incurs. This is true regardless of the patent strength, litigation length and costs, and the likelihood and timing of entry during litigation, because those factors are all reflected in those expected profits and damages. Thus, the patent holder will agree to a reverse-payment settlement only if  $(\text{profits from the reverse-payment settlement exclusion}) - (\text{reverse payment}) > (\text{profits from expected litigation exclusion}) + (\text{expected damages}) - (\text{litigation costs})$ . Rearranging, this means it must be true that  $(\text{profits from the reverse-payment settlement exclusion}) - (\text{profits from expected litigation exclusion}) > (\text{reverse payment}) - (\text{litigation costs}) + (\text{expected damages})$ .

44. If the patent holder is certain the entrant will not enter during litigation, then expected damages are zero and this formula simplifies to  $(\text{profits from the reverse-payment settlement exclusion}) - (\text{profits from expected litigation exclusion}) > (\text{reverse payment}) - (\text{litigation costs})$ . If the reverse payment exceeds litigation costs, then the right side of this inequality is positive, and therefore the profits from the settlement exclusion must exceed the profits from expected litigation exclusion. This can be true only if the settlement exclusion period is longer than the expected litigation exclusion period. Further, the larger the difference between the reverse payment and the avoided litigation costs, the more the settlement exclusion must

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<sup>62</sup> See Einer Elhauge & Alex Krueger, *Solving the Patent Settlement Puzzle*, 91 TEX. L. REV. 283, 290–92, 297–312 (2012).

exceed expected litigation exclusion to compensate. This point is illustrated in Figure 7.

**Figure 7. Reverse Payment > Avoided Patent Holder Litigation Cost  
Means Settlement Exclusion > Expected Exclusion**

### **Litigation**

<b>Patent Holder Profit from Expected Litigation Exclusion</b>	
<b>Litigation Costs</b>	<b>Net Patent Holder Profit</b>

**If Settlement Exclusion  $\leq$  Expected Exclusion, Patent Holder Would Reject Settlement**

<b>Patent Holder Profit from Settlement Exclusion</b>	
<b>Payment to Generics</b>	<b>Net Patent Holder Profit</b>

**Patent Holder Would Agree to Settlement Only if Settlement Exclusion > Expected Exclusion**

<b>Patent Holder Profits from Settlement Exclusion</b>	
<b>Payment to Generics</b>	<b>Net Patent Holder Profit</b>

45. To whatever extent the patent holder thinks it is likely that the entrant will enter during litigation, then as noted above the inequality is instead: (profits from the reverse-payment settlement exclusion) – (profits from expected litigation exclusion) > (reverse payment) – (litigation costs) + (expected damages). There will be some positive expected damages as long as the patent strength is not zero, which makes the right side of the inequality larger, requiring an even larger difference between settlement exclusion and litigation exclusion for the patent holder to rationally agree to the settlement. Thus, the more likely it is that the entrant would

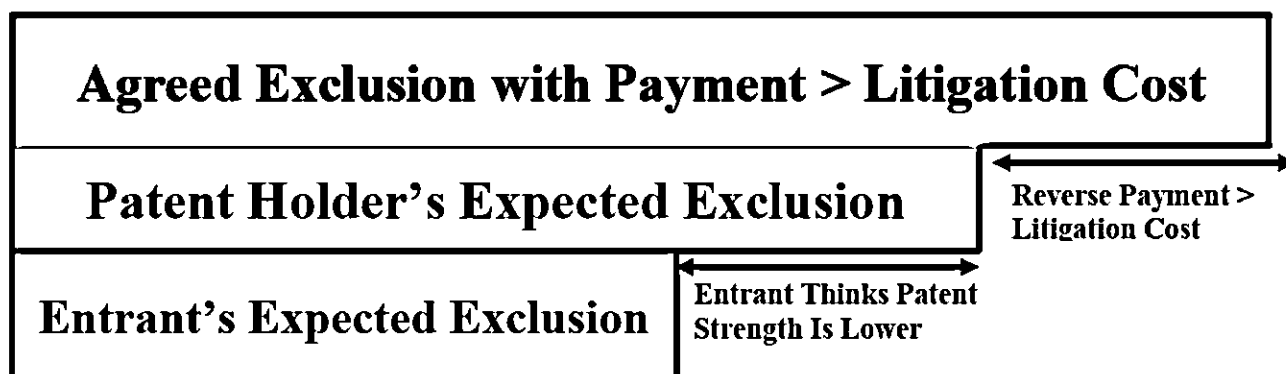
have entered during litigation, the larger the difference between the settlement exclusion and the expected litigation exclusion.

46. Therefore, a reverse-payment settlement always increases the exclusion of competition whenever the reverse payment exceeds the patent holder's avoided litigation costs. The amount by which a reverse-payment settlement delays competition increases as: (a) the size of the reverse payment increases; and (b) the likelihood of at-risk entry increases.

47. This result does not change if the parties have different perceptions of the patent strength. As explained above, if the reverse payment exceeds the patent holder's avoided litigation costs, then the settlement exclusion must exceed the patent holder's estimate of expected litigation exclusion. If the entrant has a different perception of the patent strength, there are two possibilities: the entrant thinks the patent strength is either weaker or stronger than the patent holder thinks.

48. If the entrant thinks the patent strength is weaker than the patent holder thinks, then the entrant must think the expected exclusion is even lower than the patent holder thinks. Thus, the entrant must think the settlement exclusion exceeds the expected exclusion by even longer than the patent holder thinks. Accordingly, under this possibility, both the entrant and patent holder must think the reverse-payment settlement delays entry; but the entrant thinks it delays entry even more than the patent holder thinks. This reasoning is displayed in Figure 8 below.

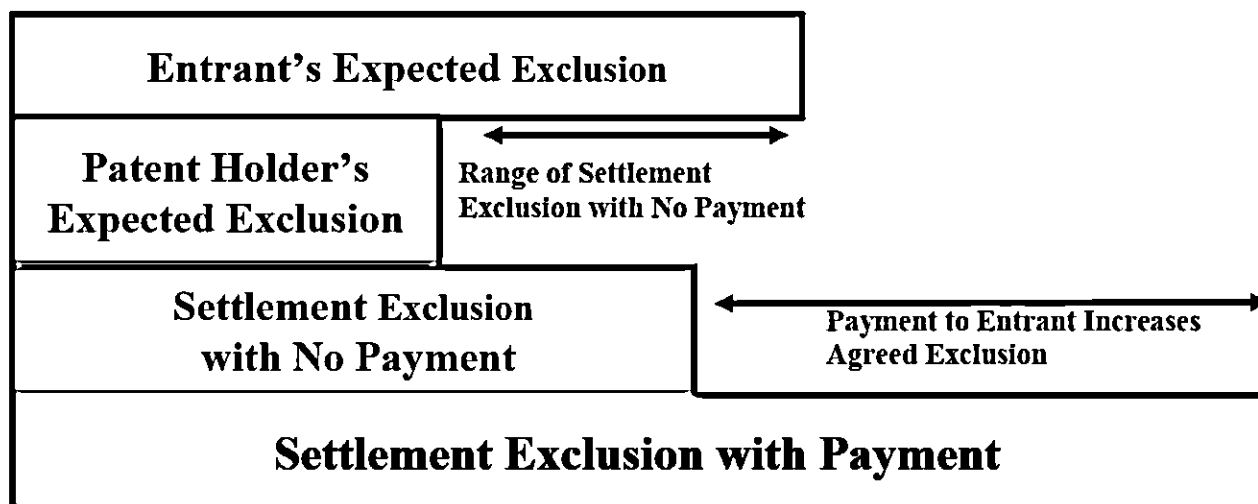
**Figure 8. Entrant Think Patent Strength Is Lower**



49. If the entrant thinks the patent strength is higher than the patent holder thinks, then the entrant believes the expected exclusion from litigation is longer than the patent holder thinks. Thus, under this possibility, they could always settle without any reverse payment by agreeing to a settlement exclusion period that is shorter than the entrant's expected exclusion period but longer than the patent

holder's expected exclusion period. Such a no-payment settlement would make both sides better off because the patent holder gets monopoly profits for longer than it otherwise expected and the entrant gets profits from market entry for longer than it otherwise expected, plus both sides avoid litigation costs. The settlement exclusion period would also be shorter with a no-payment settlement than with a reverse-payment settlement because making a reverse payment necessarily increases the settlement exclusion that a patent holder would demand and an entrant would accept. Accordingly, under this possibility, a reverse payment would not be necessary to reach a settlement and would necessarily delay entry compared to the no-payment settlement they otherwise would have reached. This is illustrated in Figure 9 below.

**Figure 9. Entrant Thinks Patent Strength Is Higher**



50. Therefore, regardless of whether the entrant's perception of patent strength is lower, higher, or equal to the patent holder's perception, a settlement with a reverse payment that exceeds the patent holder's avoided litigation costs increases the exclusion of competition. Such a reverse-payment settlement necessarily excludes competition for longer than either (1) what both parties expected from litigation or (2) the settlement exclusion both parties would have accepted without any reverse payment.

#### ***F. Reverse-Payment Settlements Do Not Encourage Optimal Innovation***

51. It might wrongly be thought that, even if a reverse-payment settlement reduces short run consumer welfare, this harm is offset because it encourages innovation that increases long-term consumer welfare. But that is not the case

because there are limits to the length of patent exclusion that is socially optimal, and a settlement that extends the patent exclusion beyond the optimal length of patent exclusion actually produces suboptimal innovation. To begin with, the patent system has to trade off the benefits of encouraging innovation against the harm of reducing the use of those innovations, where both those benefits and harms result to the extent that patents allow monopoly pricing.<sup>63</sup> If designed optimally, the patent system will maximize overall consumer welfare by giving patent holders the optimal fraction of *ex post* total surplus created by their innovations.<sup>64</sup> Accordingly, if the settlement exclusion exceeds the optimal patent exclusion, it leads to excess investment in innovation, which reduces welfare compared to optimal investment in innovation. Furthermore, a settlement that provides excessive patent protection can produce a net reduction in innovation by precluding subsequent innovations by others.<sup>65</sup> Finally, reverse-payment settlements that create a longer exclusion than merited by the patent increase patent holder profits *more* for less-deserving weak patents than for more-deserving strong patents, because the latter have a longer expected exclusion period without any reverse-payment settlement.<sup>66</sup> Because weak patents are more likely to reflect pseudo-innovation and strong patents are more likely to reflect true innovation, such reverse-payment settlements would thus distort investment choices away from true innovation towards pseudo-innovations, by

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<sup>63</sup> See John H. Barton, *Patents and Antitrust: A Rethinking in Light of Patent Breadth and Sequential Innovation*, 65 ANTITRUST L. J. 449, 450 (1997). (“The patent-antitrust analysis has always had to take into account and balance benefit to consumers by maintaining the competitive structure of existing markets against benefits to consumers by permitting the intellectual property rights system to provide an incentive for research toward new and improved products.”).

<sup>64</sup> See SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 100–03 (2004); Partha Dasgupta & Joseph Stiglitz, *Uncertainty, Industrial Structure, and the Speed of R&D*, 11 BELL J. ECON. 1, 18 (1980); Pankaj Tandon, *Rivalry and the Excessive Allocation of Resources to Research*, 14 BELL J. ECON. 152, 152, 156–57 (1983). Such a system will also maximize overall *total* welfare because competing innovators will keep spending on *ex ante* investments until their investment costs equal their expected *ex post* profits, so that the profits to patent holders wash out *ex ante*.

<sup>65</sup> See K. Levine, *A Model of Discovery*, 99 AM. ECON. REV. 337 (2009). For empirical work showing that expanding patent protections have had net negative effects on patent filings and suppressed later innovations, see generally Josh Lerner, *The Empirical Impact of Intellectual Property Rights on Innovation: Puzzles and Clues*, 99 AM. ECON. REV. 343 (2009); Fiona Murray et al., *Of Mice and Academics: Examining the Effect of Openness on Innovation* (Nat’l Bureau of Econ. Research, Working Paper No. 14819, 2009); Heidi L. Williams, *Intellectual Property Rights and Innovation: Evidence from the Human Genome* (Nat’l Bureau of Econ. Research, Working Paper No. 16213, 2010).

<sup>66</sup> See Elhauge & Krueger, *supra* note 10, at 294-95.

reducing the net reward for investing in true innovation rather than pseudo-innovation.

52. Patent law presumably has been designed to produce the socially optimal patent exclusion period. If that is so, then a settlement with a reverse payment that exceeds avoided litigation costs will produce a settlement exclusion that also exceeds the optimal patent exclusion.<sup>67</sup>

### III. LENGTH OF DELAY CAUSED BY THE REVERSE-PAYMENT SETTLEMENT

53. In this Part, I estimate how much delay the reverse payment caused in this case by comparing the entry date agreed to in the actual settlement, including the reverse payment, to the entry date that would have been agreed to a no-payment settlement.

54. Parties rationally agree to a settlement if they think it makes them better off, so for each party its settlement payoff must exceed its litigation payoff. Their settlement payoffs are determined by the settlement entry dates, their expected profits with and without entry, and the size of any reverse payment. Their expected litigation payoffs are determined by many factors, including their perceptions of patent strength (i.e., the likelihood Forest would have won the patent litigation), of the likelihood and timing of entry during litigation, of expected future litigation length and costs, and of their expected profits with and without entry. Each party's individual gain from settlement is the difference between its settlement payoff and expected litigation payoff. The sum of their individual gains from settlement are the joint gains of settlement.

55. "Bargaining power" is a reflection of how the parties split the joint gains created from settlement, and is defined simply as the percentage of the joint gains from settlement that a party is able to achieve.<sup>68</sup> The bargaining power of the

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<sup>67</sup> This was proven in Einer Elhauge & Alex Krueger, *Solving the Patent Settlement Puzzle*, 91 TEX. L. REV. 283, 290–92, 297–312 (2012).

<sup>68</sup> E.g. Abhinay Muthoo, *A Non-Technical Introduction to Bargaining Theory*, 1 World Econ. 145, 151 (2000) (describing a party's bargaining power "as captured, in general, by [their] share of the surplus"); Alan Schwartz & Robert E. Scott, *Contract Theory and the Limits of Contract Law*, Harvard Law School John M. Olin Center for Studies in Law, Economics, and Public Policy Working Papers, Paper 275, 15 (2003) (same); J. Gregory Sidak, *Bargaining Power and Patent Damages*, 19 Stan. Tech. L. Rev. 1, 12 (2015) ("It is a fundamental principle of



parties might be affected by many factors, including the sequence of negotiations, differences in personality, culture, negotiating skill, information available to the parties, and credibility in threatening to walk away from a deal.<sup>69</sup> It is difficult to directly observe these factors and quantify from scratch their impact on the share of joint gains that each side would obtain from settlement. Here, however, the parties reached an actual settlement, from which one can determine the share of joint gains each side was actually able to attain in bargaining, which reveals their actual bargaining powers on this precise topic.

56. Bargaining power reflects how the parties split the joint gains from settlement. It is distinct from factors which determine how well off the parties would be if they did not settle, such as how strong the parties thought their position was in the patent litigation. If the parties thought that the patent strength was very low, that would reduce the patent holder's expected litigation payoff and increase the entrant's. This would impact the reservation values of each party, but would not necessarily have any impact on how the parties split the joint gains from settlement, which are the *total difference* between their settlement payoffs and their reservation values/litigation payoffs. It is therefore entirely consistent for a party with a weak patent position to have strong bargaining power.

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bargaining theory that, in a negotiation, the buyer and seller divide the surplus between themselves based upon the relative bargaining power of each party.”); Kip Viscusi, *Product Liability Litigation With Risk Aversion*, 17 J. Legal Stud. 101, 102, 107-08 (1988) (explaining that where two parties will ultimately settle in a given negotiating range will depend on the parties' bargaining power and setting out a formula to determine the parties' respective bargaining power based on actual settlement results); Bruce Hay & Kathryn Spier, *Litigation and Settlement*, Harvard Law School John M. Olin Center for Law, Economics and Business Discussion Paper Series, Paper 218, 14 (1997) (a factor affecting settlement terms is “the parties' relative bargaining power in dividing the surplus from settlement”)

<sup>69</sup> See generally Fisher, Roger, William Ury, and Bruce Patton. *Getting to Yes: Negotiating Agreement without Giving in* (New York, NY: Penguin, 2d ed. 1991), accessed at [http://www.fd.unl.pt/docentes\\_docs/ma/AGON\\_MA\\_25849.pdf](http://www.fd.unl.pt/docentes_docs/ma/AGON_MA_25849.pdf); Wheeler, Michael A. "Negotiation Analysis: An Introduction." Harvard Business School Background Note 801-156, August 2000 (Revised December 2014); Daye. Thomas A., ABA Section of Litigation Corporate Counsel CLE Seminar, *Winning The Settlement – Keys to Negotiation Strategy* (February 11-14, 2010); Albert Choi & George Triantis, *The Effect of Bargaining Power on Contract Design*, 98 VA. L. REV. 1665, 1675-1676 (2012) (“The perceived bounds for the bargaining range, and the price ultimately chosen with this range, are determined by a mix of factors that might be exogenous or endogenous to the negotiations. We divide these factors into five categories: (1) demand and supply conditions, (2) market concentration, (3) private information, (4) patience and risk aversion, and (5) negotiating skills and strategy.”)

57. To calculate each side's bargaining power (i.e., how much of the joint gains from the actual settlement each party was able to capture for itself), I will simply use the estimates in Table 1 to calculate each parties' settlement payoff from the actual settlement and its expected litigation payoff. From those, it is easy to calculate its individual settlement gain (the difference between those two payoffs), the joint settlement gain (the sum of those individual settlement gains), and its bargaining power (its individual settlement gain divided by those joint gains).

58. Under the reverse-payment settlement, the patent holder Forest expected (a) to earn monopoly profits until the settlement entry date and competitive profits from that date to the end of the remaining patent period and (b) to make the reverse payment to the entrant. As indicated in Table 1, according to its own profit forecasts, the present value of the patent holder's expected profits before and after the settlement entry date is \$2,229.7 million. (Because both parties' projections at the time of settlement did not expect pediatric exclusivity to be granted, all the calculations in this Part incorporate that expectation.<sup>70</sup>) The present value of the reverse payment it would have to make was \$30.9 million. The patent holder's settlement payoff was therefore \$2,229.7 million – \$30.9 million = \$2,198.8 million.

59. If the parties had litigated, there were three possible outcomes for how long Forest would have expected to earn monopoly profits. First, if it won on both the patent merits and the validity of its patent extension, it would earn monopoly profits throughout the entire remaining patent term. Second, if it won on the patent merits, but lost on the validity of its patent extension, it would earn monopoly profits until September 12, 2013. Third, if it lost on the patent merits, it would earn monopoly profits only until the conclusion of the litigation. (As noted above, neither party would have expected Mylan to enter at risk.<sup>71</sup>) As indicated in Table 1, the present value of the profits Forest would expect to earn from maintaining its monopoly throughout the remaining patent period is \$2,332.7 million. Forest would obtain those profits only if it won on the challenges to both the patent and the patent extension. Given Mr. Johnston's estimates, the perceived likelihood that Forest would win on both issues would be  $40\% * 50\% = 20\%$ . As indicated in Table 1, the present value of the profits Forest would expect to earn from maintaining its monopoly through the patent expiration date that would apply if the extension were invalidated is \$1,633.3 million. Forest would obtain those profits only if it won on the challenge to the patent but lost on the challenge to the patent extension, of which

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<sup>70</sup> See *supra* at I.C.

<sup>71</sup> See *supra* at I.C

the perceived likelihood would be  $40\% * 50\% = 20\%$ . As indicated in Table 1, the present value of the profits Forest would expect to earn from maintaining its monopoly only until the conclusion of the litigation is \$430.7 million. Forest would obtain those profits if it lost the challenge to the patent, of which the perceived likelihood would be 60%. The patent holder's expected litigation payoff is the probability-weighted average profits from these outcomes, less its expected future litigation costs of \$3.5 million. The patent holder's expected litigation payoff is therefore  $\$2,332.7 \text{ million} * 20\% + \$1,633.3 \text{ million} * 20\% + \$430.7 \text{ million} * 60\% - \$3.5 \text{ million} = \$1,048.1 \text{ million}$ . The patent holder's gains from the settlement are therefore equal to its settlement payoff less its expected litigation payoff,  $\$2,198.8 \text{ million} - \$1,048.1 \text{ million} = \$1,150.7 \text{ million}$ .

60. Mylan's settlement payoff is equal to the present value of the profits it expected to earn between the settlement entry date and the expiration of the patent, plus the reverse payment amount that it received from Forest. As indicated in Table 1, Mylan expected to earn a present value of \$0.1 million in the three months between the settlement entry date and the patent expiration date, making its settlement payoff equal to  $\$0.1 \text{ million} + \$30.9 \text{ million} = \$31.0 \text{ million}$ .

61. If the parties had litigated, Mylan would have entered upon the conclusion of the litigation if the patent were found invalid or not infringed. It would have entered upon the expiration of the original patent term if the patent were found valid and infringed, but the patent extension invalidated. If the patent were found valid and infringed and the patent extension was upheld it would not have been able to enter until after the entire remaining patent term had passed. As indicated in Table 1, the present value of the profits Mylan expected to earn from entering upon the conclusion of the litigation is \$0.6 million, and the perceived likelihood that it would be able to obtain these profits is 60%. As indicated in Table 1, the present value of the profits Mylan expected to earn from entering when the patent would expire if the extension was invalidated is \$0.5 million, and the perceived likelihood that it would be able to obtain these profits is  $40\% * 50\% = 20\%$ . The entrant's expected litigation payoff is the probability-weighted average profits from these outcomes, less its expected future litigation costs of \$1.4 million. The entrant's expected litigation payoff is therefore  $\$0.6 \text{ million} * 60\% + \$0.5 \text{ million} * 20\% - \$2.75 \text{ million} = -\$2.3 \text{ million}$ . The entrant's gains from the settlement are therefore equal to its settlement payoff less its expected litigation payoff,  $\$31.0 \text{ million} - (-\$2.3 \text{ million}) = \$33.3 \text{ million}$ . The joint gains from settlement equal the sum of the gains to the patent holder and the entrant,  $\$1,150.7 \text{ million} + \$33.3 \text{ million} = \$1,183.9 \text{ million}$ .

62. The share of joint settlement gains that Forest was able to obtain in the actual settlement tells us its actual bargaining power relative to Mylan. Given the above figures, the share of joint gains that went to the patent holder was \$1,150.7 million out of \$1,183.9 million, which equals 97.2%. In short, the actual settlement reveals the Forest's actual bargaining power relative to Mylan was 97.2%.

63. The entry date the parties would have settled on "but for" the challenged reverse payment is the entry date they would have agreed to if everything other than the reverse payment were the same in the but-for world as it was in the actual world.<sup>72</sup> Thus, in the but-for settlement, the parties would have the same bargaining power as they had when negotiating the actual settlement. This makes economic sense because all the things that affect bargaining power would be the same in the but-for world: the but-for settlement would involve precisely the same parties as the actual settlement, with precisely the same bargaining abilities and weaknesses; precisely the same estimates of the '703 patent strength, litigation length and costs, and the timing of generic entry; and precisely the same estimates about what the other party thought about any of these issues.

64. Because Forest's actual bargaining power was 97.2%, Forest would have gotten 97.2% of the gain from the but-for no-payment settlement. The but-for settlement entry date would thus be the entry date that would give Forest 97.2% of the gain from a no-payment settlement. Using the parties own profit projections, I calculated the profits that Forest and Mylan would each expect to earn from a no-payment settlement for all possible entry dates between the first date Mylan was expected to be able to enter the market and the end of the patent term.<sup>73</sup> I then calculated the amount each side would gain from a no-payment settlement with that entry date, given their litigation payoffs and the estimates in Table 1. From that, I calculated their share of settlement gains for each possible no-payment settlement entry date. I found that the no-payment settlement entry date that would have been consistent with Forest's actual bargaining power of 97.2% is November 2, 2012.<sup>74</sup> With a November 2, 2012 no-payment settlement entry date, the settlement payoff of Forest would be \$1,149.0 million and thus its settlement gain would be \$1,149.0 million minus its litigation payoff of \$1,048.1 million, which would equal \$100.9 million. The settlement payoff of Mylan would be \$0.7 million minus its litigation payoff of -\$2.3 million, which would equal \$2.9 million. Their joint settlement gain

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<sup>72</sup> E.g., ABA Section of Antitrust Law, *Proving Antitrust Damages: Legal and Economic Issues* 54-55 (2d ed. 2010) ("To isolate the effect of the violation . . . it is important to modify the defendants' conduct in the but-for world only to the extent necessary to comply with the law.").

<sup>73</sup> Namenda Model v8.xlsm (Tab "No Pmt Entry Dates")

<sup>74</sup> Namenda Model v8.xlsm (Tab "No Pmt Entry Dates" Cell G2).

would thus be \$103.8 million. Thus, Forest would get \$100.9 million/\$103.8 million = 97.2% of the joint settlement gain. Because both sides would profit from this settlement, it was clearly feasible.

65. This analysis means that, if the parties had settled without a reverse payment, they would have agreed to a settlement with an entry date of November 2, 2012, about 26.3 months prior to the settlement entry date of January 11, 2015 agreed upon with the reverse-payment settlement. Because the but-for settlement would have had all the features of the actual settlement other than the reverse payment, it would have had the clause extending the settlement entry date in the event that pediatric exclusivity were granted. The grant of pediatric exclusivity on June 18, 2014, meant that actual generic entry occurred on July 11, 2015, rather than January 11, 2015. If one assumes that with a no-payment settlement, pediatric exclusivity would not have been obtained by November 2, 2012 (given that it was not actually obtained until June 18, 2014), then the difference between the but-for and actual entry dates would be six months greater, at 32.3 months, from November 2, 2012 to July 11, 2015. If one assumes that with a no-payment settlement, pediatric exclusivity would have been obtained by November 2, 2012 (even though it was not actually obtained until June 18, 2014), then generic entry under the no-payment settlement would have occurred six months after November 2, 2012, which is May 2, 2013, meaning that the difference between the but-for and actual entry dates would remain 26.3 months, from May 2, 2013 to July 11, 2015.

#### **IV. FINDING OF SIGNIFICANT ENTRY DELAY IS ROBUST TO CHANGES IN MODEL PARAMETERS**

66. In this Part, I consider how sensitive the analysis in Part III is to changes in the estimates of the litigation parameters developed in Part I. Specifically, I consider the impact of varying the parties' estimates of patent strength, litigation costs, reverse payment amount, the timing of generic entry if Mylan won the patent litigation, and the odds that pediatric exclusivity would be granted. In each case, I find that the reverse payment continues to cause significant delay across a wide range of possible parameter values. Therefore, my finding in Part III that the reverse payment caused a significant delay in entry is robust to changes in these parameters.

### ***A. Varying Estimates of Patent Strength and Risk Aversion***

67. In Part III above, I used Mr. Johnston's estimate of the strength of the patent and of the likelihood the patent extension would be upheld. In this Part, I demonstrate how much the reverse payment would have delayed entry at all possible patent strengths that the patent holder could have perceived while still agreeing to the actual settlement.

68. In order for the patent holder to have agreed to the actual settlement, it must have thought that the patent strength was low enough that its settlement payoff exceeded its expected payoff from continuing to litigate. Its actual settlement payoff does not depend on the patent strength it perceived, and remains as I calculated it to be in Part III: \$2,198.8 million. To determine the maximum patent strength the patent holder could have perceived while agreeing to the actual settlement, I calculated the patent holder's expected payoffs from litigating under the entire range of possible combinations of perceptions of the patent strength and various estimates of the likelihood that the patent extension would be upheld. Specifically, I consider every patent strength from 0% to 100% under three scenarios as to the likelihood that the extension would be upheld: (1) that the extension had a 50% chance of being upheld, as Mr. Johnston estimates, (2) that the extension had a 100% chance of being upheld, and (3) that Forest had the same perception of its likelihood of winning on the patent extension issue as it did on the patent merits. Under the first scenario, Forest's actual settlement payoff exceeds its litigation payoff even if it perceived that it was 100% likely to prevail on the patent merits.<sup>75</sup> Under the second scenario, Forest's actual settlement payoff exceeds its litigation payoff only if perceives its likelihood of winning on the patent merits to be less than 93.1%.<sup>76</sup> Under the third scenario, Forest's actual settlement payoff exceeds its litigation payoff only if perceives its likelihood of winning on both the patent merits and the patent extension

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<sup>75</sup> Namenda Model v8.xlsm ("Patent Strengths" tab Cell D1004, showing the patentholder's expected litigation payoff with a 100% perceived likelihood of winning the patent merits to be \$1,979.5 million, which is still less than Forest's actual settlement payoff of \$2,198.8 million.).

<sup>76</sup> Namenda Model v8.xlsm ("Patent Strengths" tab Cell K935 showing the patentholder's expected litigation payoff with a 93.1% perceived likelihood of winning the patent merits to be \$2,198.0 million. This is the highest perceived likelihood winning the patent merits at which the actual settlement payoff of \$2,198.8 still exceeds the expected litigation payoff and is therefore the maximum patent strength that Forest could have perceived while rationally accepting the actual settlement.)



to be less than 94.9%.<sup>77</sup> This means that any perceived patent strength above 93.1% under the second scenario, or above 94.9% under the third scenario, would conflict with the fact that Forest actually did agree to the settlement. In contrast, any perceived patent strength between 0% and 93.1% under the second scenario, or between 0% and 94.9% in the third scenario, would be consistent with the actual settlement. Mr. Johnston's estimate that the patent strength was at most 40% is thus consistent with the actual settlement.

69. For all possible perceived patent strengths, increased patent strength makes the but-for settlement entry date later and thus decreases the entry delay caused by the reverse payment settlement. Figure 10 below illustrates the relationship between the months of entry delay caused by the reverse payment and the perceived patent strength for all values of patent strength between 0% and 100% under the first scenario where Forest's perceived likelihood of maintaining its patent extension is 50% (setting the patent expiration date to September 12, 2013), using the same methodology as in Part III but altering the patent strength estimate.

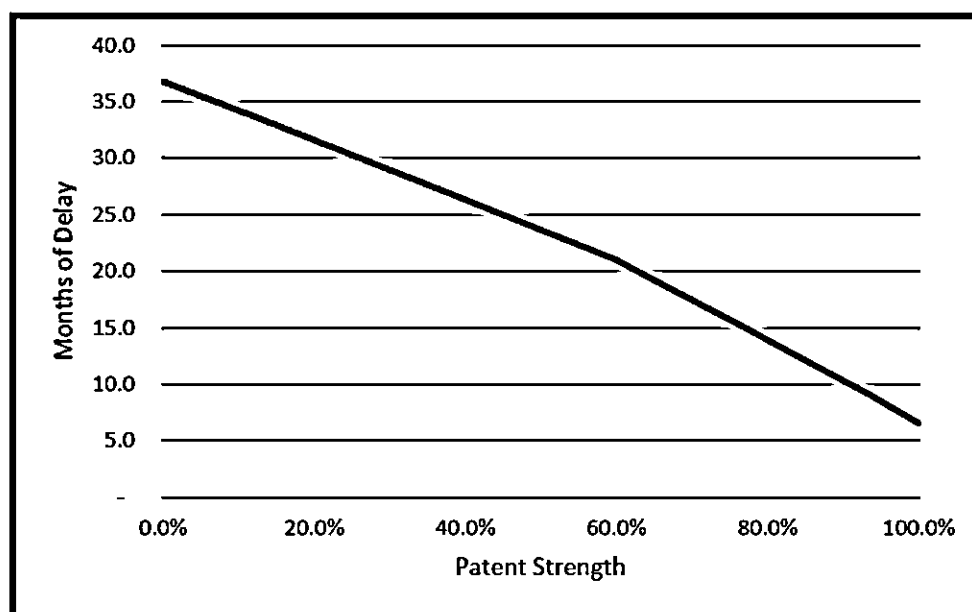
70. Throughout this Part, the "entry delay" is defined as the difference between the entry date in the actual reverse-payment settlement and the entry date in the no-payment settlement the parties would have otherwise reached. As noted in Part III, the actual entry delay would be an additional six months if the pediatric exclusivity would not have been granted by the time of the no-payment settlement entry date. The "entry delay" figures in this Part all omit that additional delay, assuming instead that pediatric exclusivity would have been granted by the no-payment settlement entry date. These figures thus provide a floor on the total entry delay, which should be increased by an additional six months to the extent one concludes that pediatric exclusivity would not have been obtained before the entry date in the no-payment settlement. With that understanding of the term, the range of entry delay caused by the reverse payment across all possible patent strengths is 6.5 to 36.8 months.<sup>78</sup> These calculations use all the parameters in Table 1 other than patent strength.

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<sup>77</sup> Namenda Model v8.xlsm ("Patent Strengths" tab Cell R953 showing the patentholder's expected litigation payoff with a 94.9% perceived likelihood of winning the patent merits to be \$2,198.3 million. This is the highest perceived likelihood winning the patent merits at which the actual settlement payoff of \$2,198.8 still exceeds the expected litigation payoff and is therefore the maximum patent strength that Forest could have perceived while rationally accepting the actual settlement.)

<sup>78</sup> Namenda Model v8.xlsm ("Patent Strengths" Tab Cells G4:G1004).

**Figure 10. Effect of Varying the Perceived Patent Strength on Entry Delay Caused by the Reverse Payment in First Scenario**

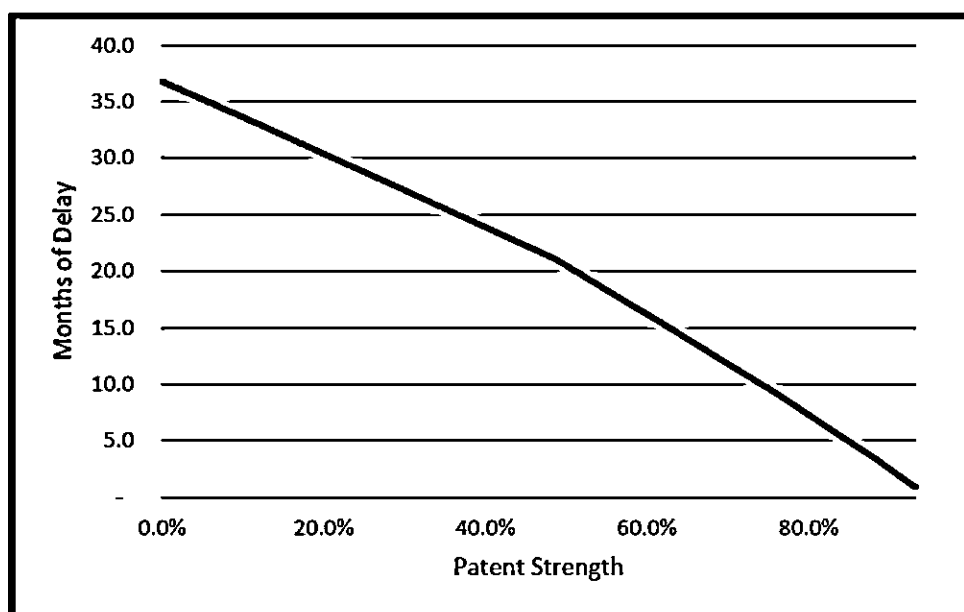


71. Figure 11 below illustrates the relationship between the months of entry delay caused by the reverse payment and the perceived patent strength for all values of patent strength between 0% and 93.1% (the maximum that Forest could have perceived given its agreement to the actual settlement) under the second scenario where Forest's perceived likelihood of maintaining its patent extension is 100% (meaning Forest expected the patent expiration date to remain April 11, 2015 with certainty), again using the same methodology as in Part III but altering the patent strength estimate. The range of entry delay caused by the represent across all possible patent strengths is 0.9 to 36.8 months.<sup>79</sup> These calculations use all the parameters in Table 1 other than patent strength.

<sup>79</sup> Namenda Model v8.xlsm ("Patent Strengths" Tab Cells N4:N1004).



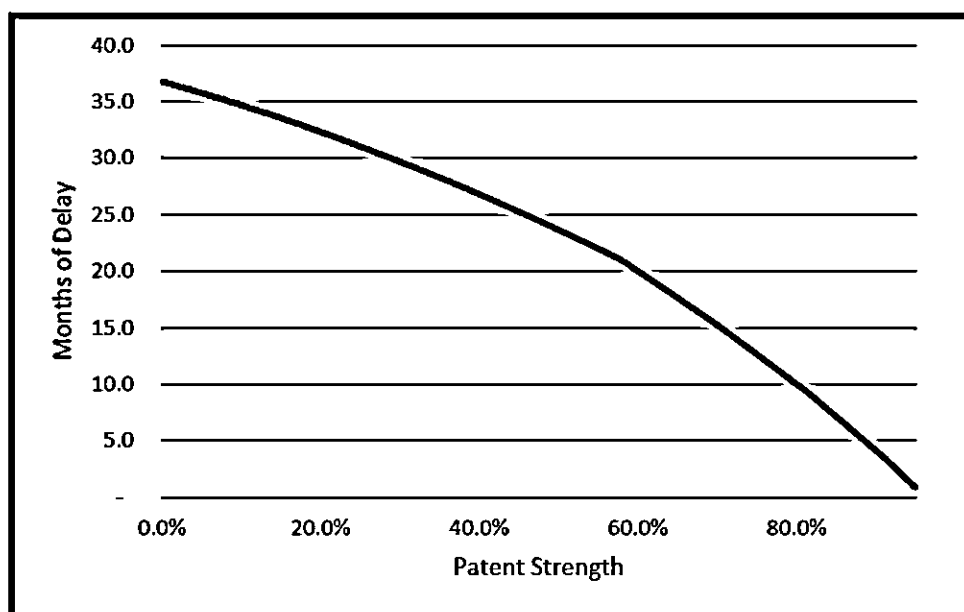
**Figure 11. Effect of Varying the Perceived Patent Strength on the Entry Delay Caused by the Reverse Payment in Second Scenario**



72. Figure 12 below illustrates the relationship between the months of entry delay caused by the reverse payment and the perceived patent strength for all values of patent strength between 0% and 94.9% (the maximum that Forest could have perceived given its agreement to the actual settlement) under the third scenario where Forest's perceived likelihood of maintaining its patent extension is the same as its perceived likelihood of winning the patent merits, again using the same methodology as in Part III but altering the patent strength estimate. The range of entry delay caused by the reverse payment across all possible patent strengths is 0.9 to 36.8 months.<sup>80</sup> (These calculations use all the parameters in Table 1 other than patent strength).

<sup>80</sup>Namenda Model v8.xlsm ("Patent Strengths" Tab Cells U4:U1004).

**Figure 12. Effect of Varying the Perceived Patent Strength on the Entry Delay Caused by the Reverse Payment in Third Scenario**



73. I can further show how the amount of entry delay caused by the reverse payment changes if the parties had different estimates of the patent strength from each other. The following Tables show the months of entry delay caused by the reverse-payment settlement for various possible combinations of patent strength perceptions under three patent extension strength scenarios, again using the same methodology as in Part III but altering the patent strength estimates.<sup>81</sup> In the first scenario, the parties each estimate that there is a 50% likelihood the patent extension will be upheld, regardless of how they perceive the patent strength. In the second scenario, the parties each estimate that there is 100% certainty the extension will be upheld, regardless of how they perceive the patent strength. In the third scenario, the parties estimate that the likelihood that the patent extension will be upheld to be the same as the likelihood that the patent will be found valid and infringed. As Tables 2-4 show, the entry delay remains substantial even if the parties had differing expectations of the patent strength. In Tables 3 and 4, “X” means the combination would conflict with the actual settlement because it would not have been rational for

<sup>81</sup> Namenda Model v8.xlsm (“Diff Patent Strengths” tab. These tables were created by using a macro to change the input parameters to correspond with the appropriate patent strengths for each cell in the table for each scenario and determine how the parties split the gains from the actual settlement if they held those patent strength perceptions. The difference between the actual settlement entry date and the no-payment settlement entry date which would split the gains the same way is then the delay caused by the reverse payment.)

both sides to have accepted the settlement if they believed the patent strength to be as described in that cell of the table.

<b>Table 2: Months of Entry Delay Caused by the Reverse Payment at Different Expectations for Patent Strength -- Under Scenario 1</b>							
		<b>Mylan Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Forest Perceived Patent Strength</b>	<b>0%</b>	36.8	36.8	36.6	36.6	36.4	36.4
	<b>20%</b>	31.7	31.7	31.5	31.4	31.4	31.3
	<b>40%</b>	26.4	26.3	26.3	26.3	26.2	26.2
	<b>60%</b>	21.1	21.1	21.1	21.0	20.9	20.9
	<b>80%</b>	14.1	14.0	14.0	13.9	13.9	13.9
	<b>100%</b>	6.6	6.6	6.6	6.6	6.6	6.5

<b>Table 3: Months of Entry Delay Caused by the Reverse Payment at Different Expectations for Patent Strength -- Under Scenario 2</b>							
		<b>Mylan Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Forest Perceived Patent Strength</b>	<b>0%</b>	36.8	36.6	36.6	36.4	36.3	36.3
	<b>20%</b>	30.5	30.4	30.3	30.3	30.2	30.1
	<b>40%</b>	24.0	24.0	23.9	23.8	23.8	23.7
	<b>60%</b>	16.4	16.3	16.3	16.2	16.1	16.1
	<b>80%</b>	7.4	7.4	7.4	7.3	7.3	7.3
	<b>100%</b>	X	X	X	X	X	X

<b>Table 4: Months of Entry Delay Caused by the Reverse Payment at Different Expectations for Patent Strength -- Under Scenario 3</b>							
		<b>Mylan Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Forest Perceived Patent Strength</b>	<b>0%</b>	36.8	36.8	36.6	36.6	36.4	36.3
	<b>20%</b>	32.4	32.4	32.2	32.1	32.0	31.9
	<b>40%</b>	26.9	26.9	26.8	26.7	26.6	26.5
	<b>60%</b>	20.1	20.1	20.1	20.0	19.9	19.8
	<b>80%</b>	10.2	10.1	10.1	10.1	10.0	10.0
	<b>100%</b>	X	X	X	X	X	X

74. Allowing the parties' patent strengths to differ also allows me to demonstrate how any risk aversion would change the results. My model so far reflects a premise that the parties are risk neutral, for all the reasons detailed below

in Part V.B. If one nonetheless wished to credit risk aversion, the impact of any risk aversion on the part of the parties can be incorporated into the model through an adjustment to their perceptions of the patent strength. To see this, consider a risk-averse patent holder, who gets an amount  $X$  if it wins the patent litigation (with perceived probability  $\theta_P$ ) and a lower amount  $Y$  if it loses the patent litigation (with probability  $1 - \theta_P$ ). The additional amount that the patent holder actually receives if it wins is  $X - Y$ . If the patent holder were risk averse with respect to the litigation, then it would value this additional payoff from winning at something less than 100% of its full dollar value. Let's call its risk-adjusted valuation of this additional payoff  $\alpha(X - Y)$  with  $0 < \alpha < 1$ . Its risk-adjusted expected value of this additional amount is then  $\theta_P \alpha(X - Y)$ . When stated this way, it is clear that the risk-adjustment factor,  $\alpha$ , can be applied to either the probability or the value that it derives from the additional payoffs, and achieve the same risk-adjusted expected value. So it is equivalent to say that it values  $X - Y$  fully, but to then apply the risk adjustment to its perceived probability of winning. Its risk-adjusted perceived probability of patent victory is thus  $\alpha\theta_P$ , which is less than the true perceived probability of patent victory. In order to account for risk aversion then, it is only necessary to substitute this lower risk-adjusted patent holder perception of the patent strength for the true patent holder perception of the patent strength in the formulas. The result is the reverse for an entrant: its risk-adjusted perception of the patent strength is higher than its true perception of that strength. So the effect of incorporating risk aversion into the model is to increase the entrant's patent strength perception ( $\theta_E$ ) and decrease the patent holder's patent strength perception ( $\theta_P$ ), which creates a wider range of possible no-payment settlements.<sup>82</sup>

75. Below, in Figure 13, I illustrate the impact on the months of entry delay of different levels of party risk aversion.<sup>83</sup> In this figure, I apply the risk aversion factor  $\alpha$  to Part III's baseline estimates of the parties' expected likelihood of winning on the patent merits and on the extension issue. This figure shows that without any risk aversion ( $\alpha = 100\%$ ), the entry delay would be 26.3 months, and that for any amount of risk version (i.e., all  $\alpha < 100\%$ ), the entry delay is greater. If the parties were maximally risk averse ( $\alpha = 0\%$ ), that is they placed *zero* value on any additional profits they would expect to earn from winning the patent litigation compared to losing it, the reverse payment in this case would have delayed entry by 36.2 months.

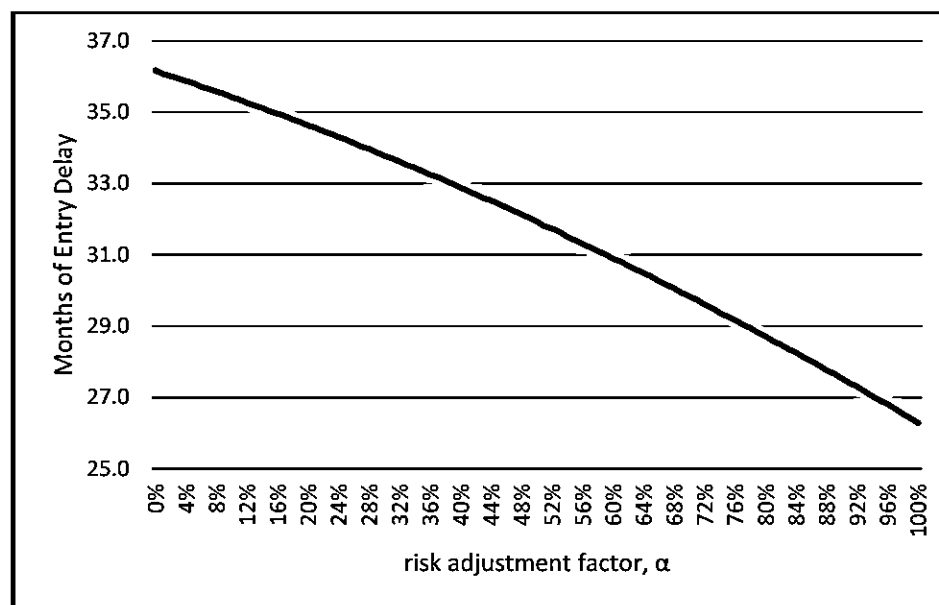
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<sup>82</sup> It would also make entrants less likely to enter at risk, given that the risk-adjusted  $\theta_E$  they use in deciding whether or not to enter would be higher than their true perceived  $\theta_E$ , but that does not matter here because I assume no at-risk entry would occur even without risk aversion.

<sup>83</sup> Namenda Model v8.xlsm ("Diff Patent Strengths" Tab Cells A35:O237).

Thus, this figure shows that if the parties were risk averse, that would only increase the entry delay caused by the reverse payment.

**Figure 13. The Entry Delay Caused by the Reverse Payment at Various Levels of Risk Aversion**



76. Although the preceding figure applies risk aversion to Part III's baseline estimates of the parties' expected likelihood of winning on the patent merits and on the extension issue, the effect holds more generally. The effect of risk aversion is to decrease each party's risk-adjusted expected litigation payoffs, consequently increasing the amount each party gains from settlement. Therefore any increase in risk aversion on Forest's part would only serve to increase its share of the gains from settlement, which increases the amount of delay it is able to purchase with the reverse payment. Risk aversion on Mylan's part has the opposite effect. However, the effect of any risk aversion on Mylan's part is much less than that of any risk aversion on Forest's part, because Forest has so much more profits at risk in the litigation than Mylan does. For this reason, risk aversion by Forest and Mylan would increase the entry delay caused by the reverse payment as long as their estimate of the likelihood that Forest would win on the patent merits and on the extension issue exceeds 3%.<sup>84</sup>

<sup>84</sup> To show this, I calculated the entry delay caused by the reverse payment for all levels of risk aversion for all commonly held perceptions of patent strength and patent extension strength. For all commonly held perceptions greater than 3%, the risk aversion factor which causes the

77. Allowing differing patent strength perceptions, whether due to risk aversion, optimism, or any other factors, would not have rendered a no-payment settlement unfeasible in this case. This is because Mylan's saved litigation costs exceed the profits it could make from entry even if it were 100% certain it would win the litigation. Therefore, any no-payment settlement entry date up until the patent expiration date would be acceptable to it, regardless of its patent strength perception. For Forest, there is always at least some range of entry dates that would be acceptable to it in a no-payment settlement since it found an entry date 3 months prior to settlement to be acceptable even when it had to pay a reverse payment in order to obtain it. Because all dates would be acceptable to Mylan, and some would be acceptable to Forest, for all possible patent strength perceptions, a no-payment settlement would necessarily have been feasible regardless of patent strength perceptions.

### ***B. Timing of Entry If Mylan Won the Patent Litigation***

78. My finding that the reverse payment caused a significant delay in entry is also robust to changes in the expected timing of Mylan's entry if it had instead continued and won the patent litigation. As discussed in Part III, I conclude that without settlement Mylan would not have entered during the patent litigation and, if it won, would have entered the market upon the conclusion of that litigation, which was estimated to be October 1, 2011. In this section, I test the sensitivity of the calculated entry delay to different estimates of this expected post-litigation entry date. The earliest post-litigation entry date considered in this analysis is April 1, 2011, which is the earliest generic entry date modeled by Forest in its forecasts. The latest post-litigation entry date considered in this analysis is October 1, 2012, which is one year later than the generic entry date that Mylan forecast with litigation and well beyond the latest date that Mr. Johnston estimates for the end of the patent litigation.

79. In Figure 14 below, I illustrate the relationship between the post-litigation entry date and the months of entry delay caused by the reverse payment for a range of post-litigation entry dates from April 1, 2011 to October 1, 2012.<sup>85</sup> (As noted in Section IV.A, all these figures omit the additional six months of entry delay that would have been caused if pediatric exclusivity would not have been

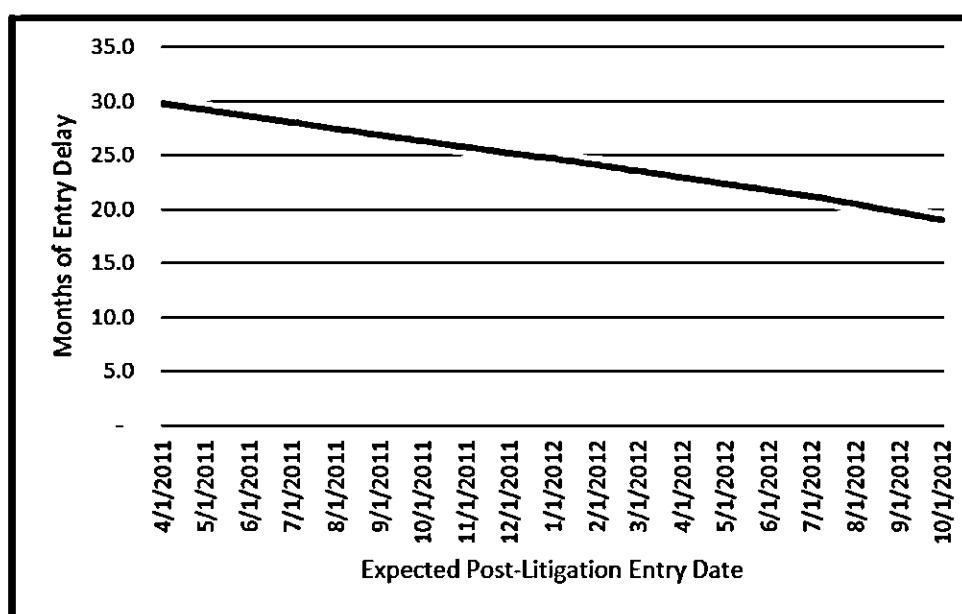
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minimum amount of delay is  $\alpha = 1$ , meaning that any degree of risk aversion would increase entry delay. Namenda Model v8.xlsm ("Patent Strengths" Tab Cells J37:K137).

<sup>85</sup> "Namenda Model v8.xlsm" ("Entry Timing" tab).

granted by the time of the no-payment settlement entry date.) I calculate the amount of entry delay caused by the reverse payment using the same methodology as in Part III, but varying the timing of post-litigation entry. A later expected post-litigation entry date makes the but-for settlement entry date later and thus decreases the entry delay caused by the reverse payment settlement. The range of entry delay caused by the reverse payment, across all reasonable expected dates of post-litigation entry, is 19.0 to 29.9 months. These calculations use all the parameters in Table 1, other than the expected date of post-litigation entry.

**Figure 14. Effect of Varying the Expected Post-Litigation Entry Date on the Entry Delay Caused by the Reverse Payment**



80. I can further show how the results change with changes to the estimates of both the patent strength and the timing of post-litigation entry. The following Tables show the months of entry delay caused by the reverse-payment settlement for various possible combinations of perceived patent strength and post-litigation entry dates under three patent extension strength scenarios. As Tables 5-7 show, the entry delay remains substantial no matter what the assumed combination of patent strength and post-litigation entry date.<sup>86</sup> In Tables 6 and 7, “X” means the combination would

<sup>86</sup> Namenda Model v8.xlsm (“Table Creation” tab.) These tables were created by using a macro to change the input parameters to correspond with the appropriate patent strength and post-litigation entry date for each cell in the table for each scenario and determine how the parties split the gains from the actual settlement if they held those perceptions. The entry delay caused by the

conflict with the actual settlement because it would not have been rational for both sides to have accepted the settlement if they believed the patent strength and post-litigation entry date to be as described in that cell of the table. Although these Tables assume the parties have the same estimate of patent strength to enable presentation in a two-dimensional page, the finding that the reverse payment causes entry delay holds for any different estimates of patent strength they might have that are consistent with their agreement to the actual settlement.<sup>87</sup>

<b>Table 5: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- Under Scenario 1</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Expected Post-Litigation Entry Date</b>	<b>April 1, 2011</b>	42.2	36.1	29.9	23.4	15.5	6.6
	<b>July 1, 2011</b>	39.4	33.9	28.1	22.1	14.7	6.5
	<b>October 1, 2011</b>	36.8	31.7	26.3	21.0	13.9	6.5
	<b>January 1, 2012</b>	34.1	29.5	24.7	19.6	13.3	6.7
	<b>April 1, 2012</b>	31.3	27.2	22.9	18.0	12.4	6.6
	<b>July 1, 2012</b>	28.5	24.8	21.2	16.5	11.6	6.5
	<b>October 1, 2012</b>	25.7	22.6	19.0	15.0	10.8	6.5

reverse payment equals the difference between the actual settlement entry date and the no-payment settlement entry date that would result in the same percentage split of gains as in the actual settlement given those perceptions.

<sup>87</sup> For any set of patent strength perceptions that are consistent with the settlement, each side achieved at least some gains from the settlement. Consequently the share of the joint gains from settlement obtained by Forest was necessarily between 0% and 100% for any patent strength perceptions consistent with the settlement. If Forest obtained 0% of the gains in a no-payment settlement, that would correspond to an entry delay of 0.9 months, *see* Namenda Model v8.xlsm ("No Pmt Entry Dates" Tab Cell F3), and if it obtained more gains from a no-payment settlement, it would get even greater delay.



<b>Table 6: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- Under Scenario 2</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Expected Post-Litigation Entry Date</b>	<b>April 1, 2011</b>	42.2	35.0	27.4	19.2	8.9	X
	<b>July 1, 2011</b>	39.4	32.7	25.6	17.7	8.1	X
	<b>October 1, 2011</b>	36.8	30.4	23.9	16.2	7.3	X
	<b>January 1, 2012</b>	34.1	28.2	22.3	14.8	6.6	X
	<b>April 1, 2012</b>	31.3	25.9	20.3	13.1	5.6	X
	<b>July 1, 2012</b>	28.5	23.6	18.0	11.6	4.8	X
	<b>October 1, 2012</b>	25.7	21.4	15.8	10.1	4.0	X

<b>Table 7: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- Under Scenario 3</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Expected Post-Litigation Entry Date</b>	<b>April 1, 2011</b>	42.2	36.9	30.4	22.7	11.6	X
	<b>July 1, 2011</b>	39.4	34.5	28.6	21.4	10.7	X
	<b>October 1, 2011</b>	36.8	32.4	26.8	20.0	10.0	X
	<b>January 1, 2012</b>	34.1	30.2	25.2	18.6	9.4	X
	<b>April 1, 2012</b>	31.3	27.9	23.5	17.0	8.4	X
	<b>July 1, 2012</b>	28.5	25.6	21.7	15.5	7.6	X
	<b>October 1, 2012</b>	25.7	23.3	19.7	14.0	6.8	X

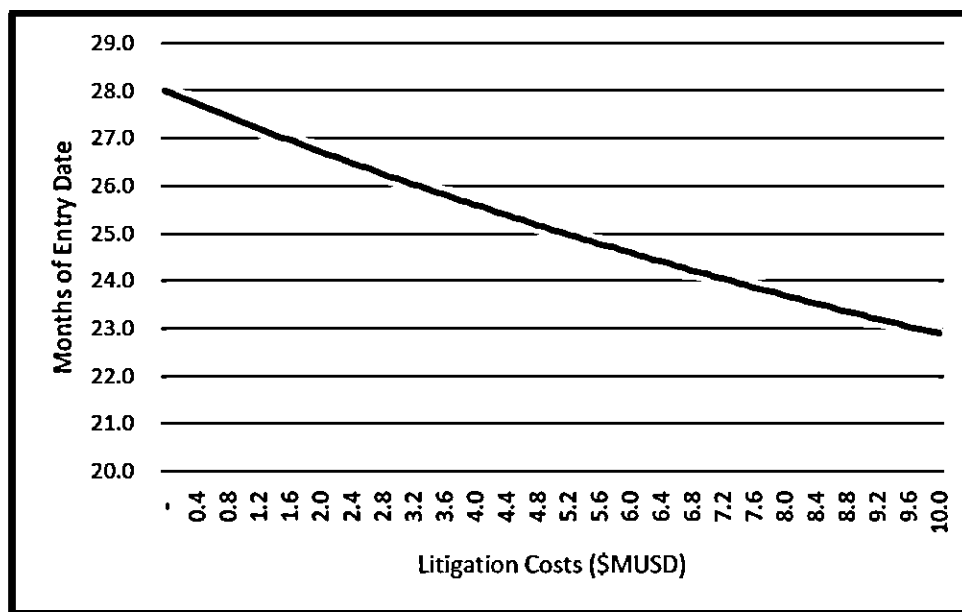
### *C. Litigation Costs*

81. My finding that the reverse payment caused a significant delay in entry is also robust to changes in the parties' expected future litigation costs at the time of settlement. As discussed in Part I, I rely on estimates that these expected future litigation costs would have been \$3.5 million for Forest and \$2.75 million for Mylan. In this section, I test the sensitivity of the entry delay to these expected future litigation costs.

82. For expected future litigation costs to each side from \$0 to \$10 million, increased litigation costs lower the litigation payoffs for both sides and thus increase both their settlement gains, which proportionally decreases the share of settlement gains of Forest and indicates it had lower bargaining power. This lower bargaining power in turn decreases the entry delay caused by the reverse payment settlement,

given that a patent holder with more bargaining power can bargain for greater entry delay. Thus, the months of entry delay caused by the reverse payment decrease with larger expected future litigation costs. Figure 15 below illustrates the relationship between the months of entry delay caused by the reverse payment and the expected future cost of litigation for all litigation costs from \$0 to \$10 million.<sup>88</sup> (As noted in Section IV.A, all these figures omit the additional six months of entry delay that would have been caused if pediatric exclusivity would not have been granted by the time of the no-payment settlement entry date.) \$10 million represents a very conservative upper bound on future litigation as most litigation costs would have already been incurred in this case,<sup>89</sup> and \$10 million is the 75<sup>th</sup> percentile for litigation costs for a complete patent litigation from beginning to end.<sup>90</sup> I calculate the amount of entry delay caused by the reverse payment using the same methodology as in Part III, but varying litigation costs. These calculations assume future litigation costs are the same for both parties and use all the parameters in Table 1 other than litigation costs.

**Figure 15. Effect of Varying Expected Future Litigation Cost on the Entry Delay Caused by the Reverse Payment**



<sup>88</sup> Namenda Model v8.xlsm ("Lit Costs" Tab).

<sup>89</sup> Johnston Report ¶421 (noting that the trial was only three weeks away when the parties notified the court that they had reached a settlement in principle).

<sup>90</sup> Einer Elhauge & Alex Krueger, *Solving the Patent Settlement Puzzle*, 91 TEX. L. REV. 283, 306 (2012) (citing AIPLA, Report on the Economic Survey 2011, at 35-36 (2011)).

83. I can further show how the results change with changes to the estimates of both the patent strength and post-litigation entry date under the minimum and maximum litigation cost estimates. The following Tables show the months of entry delay caused by the reverse-payment settlement for various possible combinations of perceived patent strength and post-litigation entry date, when estimating litigation cost savings from settlement for each side at \$0 (Table 8, 9 and 10) and \$10 million (Tables 11, 12 and 13).<sup>91</sup> As Tables 8 through 13 show, the entry delay remains substantial no matter what the assumed combination of litigation cost, patent strength, and post-litigation entry date. In Tables 8 through 13, “X” means the combination would be inconsistent with the observed settlement because it would not have been rational for both sides to have accepted the settlement if they believed the patent strength and post-litigation entry date to be as described in that cell of the table. Although these Tables assume the parties have the same estimate of patent strength to enable presentation in a two-dimensional page, the finding that the reverse payment causes entry delay holds for any different estimates of patent strength they might have that are consistent with their agreement to the actual settlement.<sup>92</sup>

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<sup>91</sup>Namenda Model v8.xlsm (“Table Creation” tab.) These tables were created by using a macro to change the input parameters to correspond with the appropriate patent strength, post-litigation entry date, and litigation costs for each cell in the table for each scenario and determine how the parties split the gains from the actual settlement if they held those perceptions. The entry delay caused by the reverse payment equals the difference between the actual settlement entry date and the no-payment settlement entry date that would result in the same percentage split of gains as in the actual settlement given those perceptions.

<sup>92</sup> For any set of patent strength perceptions that are consistent with the settlement, each side achieved at least some gains from the settlement. Consequently the share of the joint gains from settlement obtained by Forest was necessarily between 0% and 100% for any patent strength perceptions consistent with the settlement. If Forest obtained 0% of the gains in a no-payment settlement, that would correspond to an entry delay of 0.9 months, *see* Namenda Model v8.xlsm (“No Pmt Entry Dates” Tab Cell F3), and if it obtained more gains from a no-payment settlement, it would get even greater delay.

**Table 8: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- With \$0 Litigation Cost Savings for Each Side and Under Scenario 1**

		Perceived Patent Strength					
		0%	20%	40%	60%	80%	100%
Expected Post-Litigation Entry Date	April 1, 2011	45.4	38.6	31.8	24.8	16.7	7.0
	July 1, 2011	42.4	36.1	29.9	23.5	15.8	6.9
	October 1, 2011	39.4	33.7	28.0	22.2	14.9	6.9
	January 1, 2012	36.3	31.4	26.3	21.1	14.2	7.1
	April 1, 2012	33.3	28.9	24.3	19.4	13.3	7.0
	July 1, 2012	30.4	26.4	22.5	17.7	12.4	6.9
	October 1, 2012	27.3	24.0	20.5	16.1	11.6	6.9

**Table 9: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- With \$0 Litigation Cost Savings for Each Side and Under Scenario 2**

		Perceived Patent Strength					
		0%	20%	40%	60%	80%	100%
Expected Post-Litigation Entry Date	April 1, 2011	45.4	37.4	29.1	20.7	9.5	X
	July 1, 2011	42.4	34.8	27.3	19.0	8.6	X
	October 1, 2011	39.4	32.5	25.4	17.3	7.8	X
	January 1, 2012	36.3	30.1	23.6	15.8	7.0	X
	April 1, 2012	33.3	27.6	21.7	14.0	5.8	X
	July 1, 2012	30.4	25.1	19.4	12.4	5.0	X
	October 1, 2012	27.3	22.7	17.0	10.8	4.2	X

**Table 10: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- With \$0 Litigation Cost Savings for Each Side and Under Scenario 3**

		Perceived Patent Strength					
		0%	20%	40%	60%	80%	100%
Expected Post-Litigation Entry Date	April 1, 2011	45.4	45.4	32.4	24.0	12.3	X
	July 1, 2011	42.4	36.9	30.4	22.7	11.5	X
	October 1, 2011	39.4	34.5	28.6	21.5	10.7	X
	January 1, 2012	36.3	32.2	26.8	20.0	10.0	X
	April 1, 2012	33.3	29.7	24.9	18.3	9.0	X
	July 1, 2012	30.4	27.2	23.0	16.6	8.0	X
	October 1, 2012	27.3	24.8	21.2	15.0	7.2	X

<b>Table 11: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- With \$10 Million Litigation Cost Savings for Each Side and Under Scenario 1</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Expected Post-Litigation Entry Date</b>	<b>April 1, 2011</b>	36.1	31.1	25.8	20.3	13.2	5.7
	<b>July 1, 2011</b>	33.9	29.2	24.3	19.0	12.5	5.7
	<b>October 1, 2011</b>	31.7	27.3	22.9	17.7	11.9	5.7
	<b>January 1, 2012</b>	29.4	25.5	21.6	16.6	11.3	5.8
	<b>April 1, 2012</b>	27.0	23.6	19.8	15.3	10.6	5.7
	<b>July 1, 2012</b>	24.6	21.7	17.9	14.0	10.0	5.7
	<b>October 1, 2012</b>	22.4	19.4	16.1	12.7	9.4	5.7

<b>Table 12: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- With \$10 Million Litigation Cost Savings for Each Side and Under Scenario 2</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Expected Post-Litigation Entry Date</b>	<b>April 1, 2011</b>	36.1	30.1	23.8	16.3	7.7	X
	<b>July 1, 2011</b>	33.9	28.2	22.3	15.0	7.0	X
	<b>October 1, 2011</b>	31.7	26.3	20.9	13.7	6.3	X
	<b>January 1, 2012</b>	29.4	24.5	19.1	12.6	5.7	X
	<b>April 1, 2012</b>	27.0	22.6	17.1	11.2	4.9	X
	<b>July 1, 2012</b>	24.6	20.5	15.3	10.0	4.3	X
	<b>October 1, 2012</b>	22.4	18.1	13.4	8.7	3.6	X

<b>Table 13: Months of Entry Delay at Various Expectations for Patent Strength and Post-Litigation Entry Dates -- With \$10 Million Litigation Cost Savings for Each Side and Under Scenario 3</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Expected Post-Litigation Entry Date</b>	<b>April 1, 2011</b>	36.1	31.8	26.2	19.5	10.0	X
	<b>July 1, 2011</b>	33.9	29.8	24.8	18.1	9.3	X
	<b>October 1, 2011</b>	31.7	27.9	23.3	16.9	8.6	X
	<b>January 1, 2012</b>	29.4	26.1	22.0	15.8	8.0	X
	<b>April 1, 2012</b>	27.0	24.2	20.4	14.5	7.2	X
	<b>July 1, 2012</b>	24.6	22.3	18.5	13.1	6.5	X
	<b>October 1, 2012</b>	22.4	20.2	16.7	11.9	5.9	X
	<b>January 1, 2013</b>	19.9	17.9	14.9	10.8	5.4	X

#### ***D. Reverse Payment Amount***

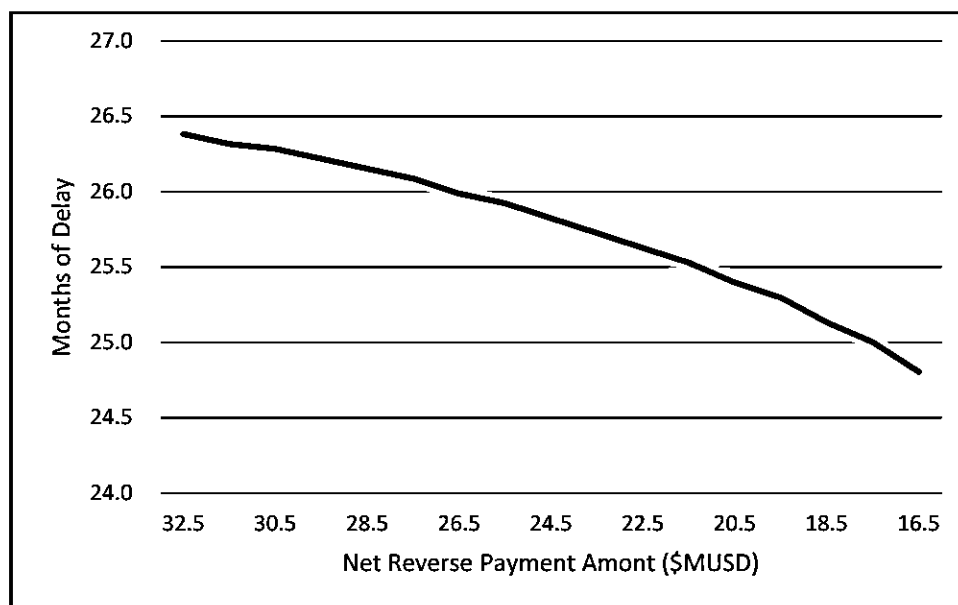
84. My finding that the reverse payment caused a significant delay in entry is also robust to changes in the size of the payment. As discussed in Part I, I rely on an estimate from Mr. Bruno that the expected increase in Mylan's costs as a result of the Lexapro amendment was between \$1.2 million and \$2.0 million. In this section, I test the sensitivity of the entry delay to different estimates of these costs, and consequently different reverse payment amounts. The larger the estimate of these costs, the smaller the net reverse payment amount to Mylan. The higher the reverse payment amount, the more entry delay a patent holder can purchase. Thus, decreases in the reverse payment size lower the amount of entry delay caused by the reverse payment.

85. Figure 16 below illustrates the relationship between the months of entry delay caused by the reverse payment and the size of the reverse payment for expected costs from 0 to 10 times the amount that Mr. Bruno estimated.<sup>93</sup> (As noted in Section IV.A, all these figures omit the additional six months of entry delay that would have been caused if pediatric exclusivity would not have been granted by the time of the no-payment settlement entry date.) This corresponds to estimates of costs between \$0 and \$16.0 million, and net reverse payment sizes of between \$16.5 million and \$32.5 million. I calculate the amount of entry delay caused by the reverse payment using the same methodology as in Part III, but varying the size of the reverse

<sup>93</sup> Namenda Model v8.xlsm ("Rev Pmt Sens" Tab).

payment. These calculations use all the parameters in Table 1 other than the reverse payment amount.

**Figure 16. Effect of Varying Reverse Payment Size on the Entry Delay Caused by the Reverse Payment**



86. I can further show how the results change with changes to the estimates of both the patent strength and reverse payment amount. The following Tables shows the months of entry delay caused by the reverse-payment settlement for various possible combinations of perceived patent strength and reverse payment size under three patent extension strength scenarios. As Tables 14-16 show, the entry delay remains substantial no matter what the assumed combination of patent strength and reverse payment amount.<sup>94</sup> Although these Tables assume the parties have the same estimate of patent strength to enable presentation in a two-dimensional page, the finding that the reverse payment causes entry delay holds for any different

<sup>94</sup> Namenda Model v8.xlsm (“Rev Pmt Sens” tab.) These tables were created by using a macro to change the input parameters to correspond with the appropriate patent strength and reverse payment amount for each cell in the table for each scenario and determine how the parties split the gains from the actual settlement if they held those perceptions. The entry delay caused by the reverse payment equals the difference between the actual settlement entry date and the no-payment settlement entry date that would result in the same percentage split of gains as in the actual settlement given those perceptions.

estimates of patent strength they might have that are consistent with their agreement to the actual settlement.<sup>95</sup>

<b>Table 14: Months of Entry Delay at Various Expectations for Patent Strength and Reverse Payment Amount -- Under Scenario 1</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Reverse Payment Amount (\$M USD)</b>	<b>32.5</b>	36.8	31.7	26.4	21.1	14.0	6.6
	<b>28.5</b>	36.5	31.4	26.2	20.8	13.8	6.5
	<b>24.5</b>	36.0	31.0	25.8	20.5	13.6	6.4
	<b>20.5</b>	35.4	30.5	25.4	20.1	13.3	6.3
	<b>16.5</b>	34.6	29.7	24.8	19.5	13.0	6.1

<b>Table 15: Months of Entry Delay at Various Expectations for Patent Strength and Reverse Payment Amount -- Under Scenario 2</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Reverse Payment Amount (\$M USD)</b>	<b>32.5</b>	36.8	30.5	24.0	16.3	7.3	1.0
	<b>28.5</b>	36.5	30.2	23.7	16.1	7.3	0.9
	<b>24.5</b>	36.0	29.8	23.5	15.8	7.1	0.7
	<b>20.5</b>	35.4	29.3	23.1	15.5	7.0	0.6
	<b>16.5</b>	34.6	28.6	22.6	15.1	6.8	0.5

<sup>95</sup> For any set of patent strength perceptions that are consistent with the settlement, each side achieved at least some gains from the settlement. Consequently the share of the joint gains from settlement obtained by Forest was necessarily between 0% and 100% for any patent strength perceptions consistent with the settlement. Even at the low end of the net reverse payment size, where the costs are assumed to be 10x Mr. Bruno's estimate, if Forest obtained 0% of the gains in a no-payment settlement, that would correspond to an entry delay of 0.5 months, *see* Namenda Model v8.xlsm ("No Pmt Entry Dates" Tab Cell F3 after changing "Inputs" Tab Cells C35 and C36 to 16.5), and if it obtained more gains from a no-payment settlement, it would get even greater delay.



<b>Table 16: Months of Entry Delay at Various Expectations for Patent Strength and Reverse Payment Amount -- Under Scenario 3</b>							
		<b>Perceived Patent Strength</b>					
		<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
<b>Reverse Payment Amount (\$M USD)</b>	<b>32.5</b>	36.8	30.5	24.0	16.3	7.3	1.0
	<b>28.5</b>	36.5	30.2	23.7	16.1	7.3	0.9
	<b>24.5</b>	36.0	29.8	23.5	15.8	7.1	0.7
	<b>20.5</b>	35.4	29.3	23.1	15.5	7.0	0.6
	<b>16.5</b>	34.6	28.6	22.6	15.1	6.8	0.5

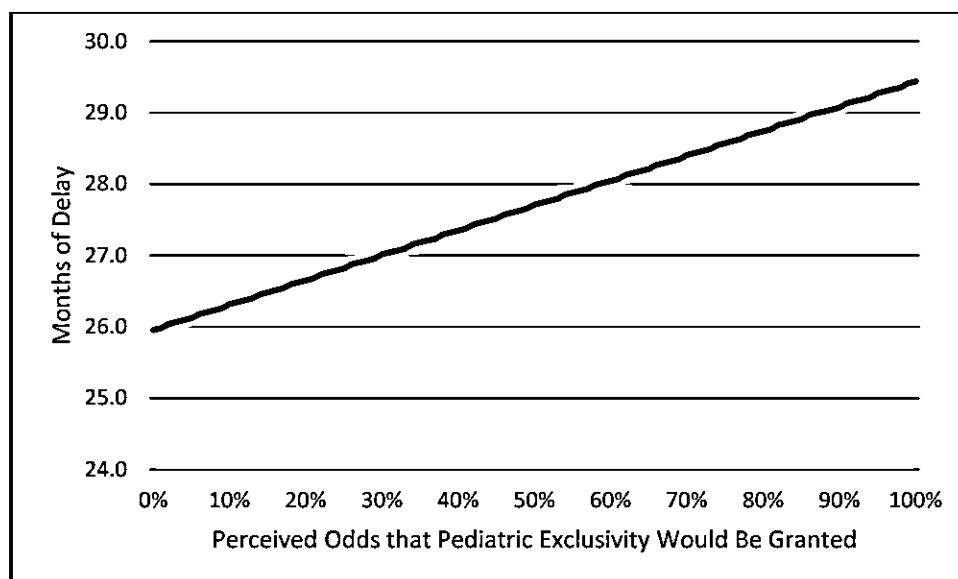
### *E. Expected Odds of Pediatric Exclusivity*

87. My finding that the reverse payment caused a significant delay in entry is also robust to different party estimates (at the time of settlement) of the odds that pediatric exclusivity would be granted. As discussed in Section I.A, the parties did not (at the time of settlement) forecast pediatric exclusivity being granted. In this section, I demonstrate that the finding of significant delay remains even if the parties did expect pediatric exclusivity to be granted, or for any perceived likelihood the parties had of it being granted between 0% and 100%. If the parties did (at the time of settlement) expect pediatric exclusivity to be granted in the event of continued patent litigation, then they would have expected the end of Forest's exclusivity period to be six months later, which would be October 11, 2015 if the patent extension were upheld or March 12, 2014 if the patent extension were held invalid. If they expected pediatric exclusivity to be granted, they also would have expected entry under the actual settlement to be delayed by six months to July 11, 2015 and entry under a no-payment settlement to be six months later than the nominal date in the no-payment settlement. With these modifications, and keeping all other input parameters the same as they are in Table 1, I calculate that if the parties fully expected pediatric exclusivity to be granted, the no-payment entry date would be January 16, 2013, which is 29.4 months before the entry date under the settlement if pediatric exclusivity were granted.<sup>96</sup> The effect of increasing the likelihood the parties perceived of pediatric exclusivity being granted at the time of settlement is to push the expected entry date later under both the actual and the no-payment settlement. The difference between the two dates (the expected delay caused by the reverse payment) actually decreases as the perceived likelihood of pediatric exclusivity being granted increases.

<sup>96</sup> Namenda Model v8.xlsm ("Ped Excl" Tab Cell L106).

88. Figure 17 below illustrates the relationship between the months of entry delay caused by the reverse payment and the likelihood that the parties perceived of the pediatric extension being granted.<sup>97</sup> I calculate the amount of entry delay caused by the reverse payment using the same methodology as in Part III, but varying the odds of pediatric exclusivity. These calculations use all the parameters in Table 1, other than the expected likelihood of pediatric exclusivity being granted. Although this chart uses the parameter estimates in Table 1, the finding that the reverse payment causes entry delay holds for any different estimates of the patent strength that the parties might have had that are consistent with the actual settlement.<sup>98</sup>

**Figure 17. Effect of Varying Perceived Likelihood of Pediatric Exclusivity Being Granted on the Entry Delay Caused by the Reverse Payment**



<sup>97</sup> Namenda Model v8.xlsm (“Ped Excl” Tab).

<sup>98</sup> For any set of patent strength perceptions that are consistent with the settlement, each side achieved at least some gains from the settlement. Consequently the share of the joint gains from settlement obtained by Forest was necessarily between 0% and 100% for any patent strength perceptions consistent with the settlement. If Forest obtained 0% of the gains in a no-payment settlement, that would correspond to an entry delay of 0.9 months, *see* Namenda Model v8.xlsm (“No Pmt Entry Dates” Tab Cell F3), and if it obtained more gains from a no-payment settlement, it would get even greater delay.

## V. THE REVERSE PAYMENT WAS NOT JUSTIFIED IN THIS CASE

89. Defendants in reverse payment cases often allege that their use of reverse payments was justified in their case. In this Section, I discuss two commonly alleged potential justifications and demonstrate that neither of them justify the reverse payments in this case. Specifically, I consider whether avoided litigation costs or managerial risk aversion could justify the use of reverse payments in this case and find that they could not, for numerous reasons.

### *A. Avoided Litigation Costs Do Not Justify the Reverse Payment*

90. Defendants in reverse payment cases often allege that the avoidance of patent litigation costs is a procompetitive efficiency that justifies the use of the reverse payment. For at least three reasons, avoidance of litigation costs cannot justify the reverse payments used by the defendants in this case.

91. First, defendants cannot claim avoided litigation costs as a justification for the reverse payment if the reverse payment was not in fact necessary for avoiding litigation costs. As I demonstrated in Section IV.A, even if they did not hold the same perception of patent strength, a no-payment settlement was always feasible in this case. Such a no-payment settlement is thus a less-restrictive alternative to a reverse-payment settlement that can equally avoid litigation costs, resulting in a shorter settlement exclusion period and thus less harm to competition.

92. Second, even if the reverse payment were necessary to avoid the patent litigation costs in this case, these avoided litigation costs would need to be passed on to consumers in order to constitute a cognizable procompetitive justification for using a reverse payment. Because avoiding litigation costs lowers a fixed cost rather than a marginal cost, it is unlikely to lower prices in a way that gets passed on to consumers at all. Further, where the reverse payment amount exceeds the patentholder's avoided litigation costs, as it did in this case, the reverse-payment settlement actually raises, rather than lowers the patentholder's fixed costs. Therefore, even if these costs were passed through to customers, the combined effect of the cost of the reverse payment and the avoided litigation costs would be in fact to raise, rather than lower, the prices that consumers paid.

93. Third, even if the avoided litigation costs were passed through to consumers in a way that (considered in isolation) lowered prices paid by them, such a pass through would have to be large enough to offset the total overcharge that results from delaying entry. In this case, Forest expected that generic entry 3 months

earlier than the patent expiration would result in consumers paying \$400 million less than they would have if there was no generic entry prior to patent expiration.<sup>99</sup> This indicates an expectation that each day of delay in generic entry cost consumers an average of \$4.4 million. Because the total saved litigation costs for Forest were only \$3.5 million, this means that avoided litigation costs could not justify the reverse payment even if the reverse payment caused only a single day of delay in entry. In fact, as I calculated in Section III, the reverse payment caused 26.3 *months* of delay in this case.

### ***B. Risk Aversion Does Not Justify the Reverse Payment***

94. Defendants in reverse-payment cases often argue that reverse-payment settlements are justified by managerial risk aversion. This justification is inapplicable for several reasons.

95. First, the evidence does not indicate that the defendants were risk averse. All the defendants were publicly traded companies with large market capitalizations at the time of the settlement. Active capital markets for large publicly traded companies should generally enforce profit-maximizing behavior by management on behalf of shareholders, which would deter managers from acting on this form of risk aversion because such action decreases shareholder profits.<sup>100</sup> The fact that large publicly-held corporations act risk neutrally can be observed from the fact that they generally use captive insurers or otherwise self-insure risks that one would expect them to insure with third-party insurance if they were risk averse. Over 90% of Fortune 500 companies have captive insurers.<sup>101</sup> Likewise, 82.1% of firms with at least 500 employees provide health insurance for their employees by self-insuring, rather than by using outside insurance companies.<sup>102</sup> Because such large publicly-held corporations have shareholders who can easily diversify, this pattern is consistent with my point that managers generally act in the interests of shareholders by maximizing expected gains without aversion to firm-specific risks

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<sup>99</sup> FRX-AT-04134771 (comparing Cell L7 to Cell L9).

<sup>100</sup> See Elhauge & Krueger, *supra* note 8, at 312.

<sup>101</sup> Christine Hall, Why Companies Are Opting For Captive Insurance Arrangements, *Forbes* (January 28, 2013), available at <https://www.forbes.com/sites/bmoharrisbank/2013/01/28/why-companies-are-opting-for-captive-insurance-arrangements/#1f55b5c1787d>.

<sup>102</sup> Report to Congress on a Study of the Large Group Market, U.S. Department of Health and Human Services, p3, available at <https://aspe.hhs.gov/system/files/pdf/76181/index.pdf>.

that shareholders can diversify. Because the defendants here were both large publicly-held corporations, this evidence supports an assumption of risk neutrality.

96. Further, the evidence indicates that the vast majority of shareholders of both Forest and Mylan were outsiders who had an ability to diversify their shareholdings and therefore had an interest in the companies behaving risk neutrally. A Forest SEC filing indicates that, as of June 18, 2010, all of Forest's directors and executive officers as a group held only 2.88% of the company.<sup>103</sup> Similarly, a Mylan SEC filing indicates that, as of March 29, 2010, all of Mylan's directors, nominees, and executive officers as a group held only 2.0% of the company.<sup>104</sup>

97. Second, even if the parties were risk averse, a reverse payment would not be necessary to achieve any risk reduction associated with settlement, because a no-payment settlement would also allow the parties to avoid any litigation risk.<sup>105</sup> As I show in Section IV.A, a no-payment settlement was always feasible for any patent strength estimate even without any risk aversion, and risk aversion can only increase the likelihood of a no-payment settlement by lowering the litigation payoffs to both sides. Such a no-payment settlement is thus a less-restrictive alternative to a reverse-payment settlement that can equally achieve risk reduction, resulting in a shorter settlement exclusion period and thus less harm to competition.

98. Third, even if managerial risk aversion did mean a reverse payment was necessary for settlement, reverse payments that foster such risk-averse decisions lower shareholder returns and thus inefficiently reduce incentives to invest in innovation.<sup>106</sup> That would make the reverse-payment settlement affirmatively inefficient rather than show a procompetitive efficiency.

99. Fourth, if the parties were risk averse, Part IV.A shows that would actually increase the entry delay caused by the reverse payment. Thus, far from providing a procompetitive justification, risk aversion increases the anticompetitive effects.

100. Finally, if, despite the above, risk aversion were deemed a procompetitive efficiency, its application would properly be limited to cases where

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<sup>103</sup> 2010 Proxy Statement for Forest Laboratories Inc. at p.5.

<sup>104</sup> 2010 Proxy Statement for Mylan Inc., at p.17.

<sup>105</sup> See Aaron Edlin et al., *Actavis and Error Costs: A Reply to Critics*, ANTITRUST SOURCE, Oct. 2014, at 1, 4–7; Aaron Edlin et al., *Activating Actavis*, ANTITRUST, Fall 2013, at 18–20.

<sup>106</sup> See Elhauge & Krueger, *supra* note 8, at 312.

two bases are shown: (1) no settlement would have resulted without a reverse payment, because the settling entrant is excessively optimistic, and (2) management risk aversion is so high that the managers of the patent holder are willing to sacrifice expected corporate profits by not only paying the reverse payment, but also accepting a settlement exclusion period that is less than the expected litigation exclusion period. The first basis is disproven in Part IV.A, which shows that a no-payment settlement was feasible no matter what patent strength estimate the settling entrant had. The second basis could hold only if the settlement reduced expected patent holder profits. Forest's forecasts instead show that the settlement would greatly increase its expected profits,<sup>107</sup> which is thus inconsistent with any claim that risk aversion made the reverse payment settlement efficient.

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<sup>107</sup> See *supra* at Section III, showing Forest expected the settlement to increase its profits by \$1,150.7 million.

## **EXHIBIT A**

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### **EMPLOYMENT**

**Petrie Professor of Law, Harvard University**

Subjects: Antitrust, Contracts, Health Law Policy, Statutory Interpretation.

Founding Director, Petrie-Flom Center for Health Law Policy, Biotechnology and Bioethics.

Member, ABA Antitrust Section Transition Task Force 2012.

Chair, Obama Campaign's Antitrust Advisory Committee

Co-Chair, Obama Campaign's Blogs and Op-eds Committee

Member, Obama Campaign's Health Policy Advisory Committees.

Member, Editorial Board for Competition Policy International

Member, Advisory Board for the Journal of Competition Law & Economics.

Member, Advisory Board for the Social Sciences Research Network on Antitrust Law & Policy.

Member, Advisory Board for the Social Sciences Research Network on Telecommunications &  
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FTC Special Employee on Antitrust Issues.

Recipient, 2010 Jerry S. Cohen Memorial Fund Writing Award, for "Tying, Bundled Discounts,  
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Recipient, Best Academic Anticompetitive Practice Article - 2015 Antitrust Writing Awards, for  
"Robust Exclusion and Market Division Through Loyalty Discounts"

Recipient, 2017 Jerry S. Cohen Memorial Fund Writing Award, for "Horizontal Shareholding"

Books

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Elhauge, *Horizontal Shareholding*, 109 HARVARD LAW REVIEW 1267 (2016) (Awarded 2017 Jerry S. Cohen Memorial Fund Writing Award for Best Antitrust Article, as well as an Award for being one of top ten corporate and securities articles of the year)



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Elhauge, *Obamacare and the Theory of the Firm*, in THE FUTURE OF HEALTH CARE REFORM (Malani and Schill, eds., U. Chicago Press 2015)

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“Roberts' Real Long Game?,” The Atlantic (July 20, 2012)

“The Fatal Flaw In John Roberts' Analysis Of The Commerce Clause,” The New Republic (July 1, 2012)

“The Killer Precedent For Today’s Decision,” The New Republic (June 28, 2012)

“Even The Most Conservative Supreme Court Justices Have Already Declared Mandates Constitutional,” The New Republic (June 21, 2012) (with Emily Bass)

“What a Nobel Prize-Winning Economist Can Teach Us About Obamacare,” The Atlantic (May 23, 2012) (with Kevin Caves)

“A Further Response to Critics on the Founding Fathers and Insurance Mandates”, The New Republic (April 21, 2012)

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“It's Not About Broccoli!: The False Case Against Health Care,” The Atlantic (April 16, 2012)

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“Commentary: The Roberts-Kagan Compromise on Obamacare?,” The National Law Journal (March 28, 2012)

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“Florida 2000: Bush Wins Again!,” Weekly Standard (November 26, 2001 )

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"Medi-Choice," The New Republic, 24 (November 13, 1995)

"Term Limits: Voters Aren't Schizophrenic," Wall Street Journal, A-16 (March 14, 1995)

#### Harvard Committees

Chair, Harvard Law School Lateral Appointments Committee (1998-99), Member (2003-05, 2011-2014).

Member, Harvard Law School Entry Level Appointments Committee (2009-2011, 2017-18).

Member, Harvard University Standing Committee on the Degree of Doctor of Philosophy in Health Policy (1996-99, 2006-07).

Member, Harvard University Internal Advisory Board for the Interfaculty Initiative in Health Policy (1996-99).

Member, Harvard Law School Lecturers and Visitors Committee (1996-98).

#### **Past Academic Positions**

1988-95      Professor of Law, Boalt Hall, University of California at Berkeley

1995	Visiting Professor of Law, Univ. of Chicago Law School
1994	Visiting Professor of Law, Harvard Law School
1993	Visiting Olin Faculty Fellow, Yale Law School
1991-92	Visiting Scholar in Europe at the Karolinska Institute, the Centre for Health Economics, the Rockefeller Foundation Study Center, Cambridge University, the European University Institute and the University of Florence

#### **Clerkships**

1987-88	Clerk for Justice William J. Brennan, Jr., United States Supreme Court
1986-87	Clerk for Judge William A. Norris, U.S. Court of Appeals for the Ninth Circuit
1986	Clerk for U.S. Solicitor General's Office, Washington, D.C.

**Bar Admissions:** Massachusetts (2000); Pennsylvania (1986); United States Courts of Appeals for the Fourth (1997), Sixth (2008), and Ninth Circuits (1987); Supreme Court of the United States (1997).

#### **ECONOMICS EXPERT WORK**

President, Legal Economics LLC, 2007 to present.

Senior Expert at Criterion Economics LLC, 2004-2007

Named One of World's Leading Competition Economists in the *International Who's Who of Competition Lawyers and Economists*.

Testifying Expert in *In re Lidoderm Antitrust Litigation*, a case alleging a reverse payment patent settlement.

Testifying Expert in *Valassis Communications v. News Corp*, a case alleging anticompetitive bundling and other exclusionary conduct.

Testifying Expert in *GN Netcom v. Plantronics*, a case alleging exclusive dealing in the distribution of contact center and office headsets.

Testifying Expert in *Louisiana Wholesale Drug v. Unimed Pharmaceuticals (Androgel case)*, a case alleging a reverse-payment patent settlement.

Testifying Expert in *Garber v. Office of the Commissioner of Baseball*, a case alleging horizontal territorial restraints on broadcasting baseball games.

Testifying Expert in *Suture Express v. Cardinal Health*, a case alleging tying and bundled loyalty contracts in medical distribution.

Testifying Expert in *Savant v. Crestron*, a case alleging exclusive dealing in the high-end home control system market

Testifying Expert in *Castro et. al. vs Sanofi Pasteur*, a case alleging anticompetitive bundled loyalty contracts in the vaccines industry.

Testifying Expert in *In re Mushroom Direct Purchaser Antitrust Litigation*, a case alleging price-fixing in the fresh mushroom market.

Testifying Expert in *It's My Party, Inc. v. Live Nation, Inc.*, a case alleging anticompetitive conduct in markets for promotion and amphitheaters.

Testifying Expert in *Retractable Technologies v. Becton Dickinson*, a case alleging exclusionary contracts in syringe and IV catheter markets.

Testifying Expert in *Caldon v. Westinghouse Electric*, a case alleging attempted monopolization.

Testifying Expert in *King Drug v. Cephalon*, a case alleging that a reverse-payment settlement of a patent dispute delayed entry and restrained competition in a pharmaceutical market.

Testifying Expert for the United States in *United States v. Wyeth*, a case involving claims of bundled sales and bundled discounts in a pharmaceutical market, which resulted in a \$784 million settlement for the United States.

Testifying Expert in *BAE Holdings AH v. ArmorWorks Enterprises*, a case alleging price discrimination by a ceramic tile manufacturer resulting in harm to downstream competition.

Testifying Expert in *In re Marsh & McLennan Companies, Inc. Securities Litigation*, a case alleging securities violations from failure to disclose bid steering.

Testifying Expert in *Tessera Technologies v. Hynix Semiconductor*, a case alleging conspiracy to exclude outside technologies from semiconductor markets.

Testifying Expert in *American Steel Erectors v. Local Union No. 7*, a case alleging boycott claims related to steel erection and labor markets.

Testifying Expert in *BP America v. Repsol*, an arbitration.

Testifying Expert in *Food Lion v. Dean Foods Company*, a class action alleging conspiracies to restrict and foreclose competition in milk markets.

Testifying Expert in *Eisai Inc. v. Sanofi-Aventis U.S. LLC*, a case by a rival alleging foreclosure in anticoagulant pharmaceutical markets.

Testifying Expert in *Daniels v. Tyco*, a case by a rival alleging foreclosure from sharps containers and GPO markets.

Testifying Expert in *Natchitoches Parish Hospital v. Tyco*, a class action concerning medical sharps containers and GPO markets.

Testifying Expert in *Amgen v. F. Hoffman La Roche*, concerning erythropoietin-simulating agents (ESAs) and white blood cell simulators (WBCs) pharmaceutical markets.

Testifying Expert in *White v. NCAA*, concerning markets for athletic and educational services.

Testifying Expert in *Applied Medical Resources v. Ethicon, Inc.*, concerning sutures, trocars, and GPO markets.

Testifying Expert in *Masimo Corp. v. Tyco Health Care Group*, concerning oximetry products and GPO markets.

Testifying Expert in *Rochester Medical v. Bard*, concerning catheter and GPO markets.



Testifying Expert in *Retractable Technologies, Inc. v. Becton Dickinson*, concerning syringes and GPO markets.

Testifying Expert in *Spartanburg v. Hill-Rom*, a class action concerning hospital beds and GPO markets.

Testifying Expert in *Mountain Area Realty v. Wintergreen Partners*, concerning conduct in the real estate brokerage services market.

Testifying Expert in *Louisiana Municipal Police Employees' Retirement System v. Crawford*, concerning merger in the pharmacy benefit manager market.

Testifying Expert in *Capital Credit Alliance v. National Automated Clearing House Association*, concerning electronic checks market.

Testifying Expert for Intel before EC and Korean antitrust authorities on microprocessor markets.

Testifying Expert for AmBev before the EC and Brazilian antitrust authorities on beer market.

Testifying Expert for 1-800-Contacts before the FTC on OSI-CooperVision merger and agreements restraining distribution by nonprescribing retailers.

Testifying Expert in *In Re Cardizem CD Antitrust Litigation*, concerning patents and pharmaceuticals.

Testifying Expert regarding the *B.F. Goodrich-Coltec* Merger, concerning the aerospace industry.

Testifying Expert regarding the *Alcoa-Reynolds* Merger, concerning the aluminum industry

Expert Consultant to National Cable Television Association on Internet Access Bills before Congress and Interactive Television Inquiry before FCC.

Expert for Royal Caribbean for proposed mergers of Princess with Royal Caribbean and Carnival, concerning the cruise industry.

Expert for the Medical Device Manufacturers Association, producing Report to U.S. Senate and Statement to FTC/DOJ regarding exclusionary agreements between medical device suppliers and Group Purchasing Organizations and their hospitals.

## **EDUCATION**

**Harvard Law School**

J.D., June 1986

### *Awards*

Fay Diploma -- for graduating first in class

Sears Prize -- Second Year -- to top two students in class

Sears Prize -- First Year -- to top two students in class

### *Activities*

Harvard Law Review, Articles Office Co-Chair

Class Marshal

Author: *Modes of Analysis: The Theories and Justifications of Privileged Communications*,

98 HARV. L. REV. 1471-1500 (1985).

**Harvard College**

B.A., June 1982

Graduated in three years, majoring in Biochemical Sciences. GPA 3.9

## **PERSONAL**

Born of Argentinian immigrants in New York City. First language was Spanish. Live with wife and 3 children in Newton, Massachusetts.

## EXHIBIT B

### DOCUMENTS RELIED UPON

#### Academic and Industry Literature:

Federal Trade Commission, *Generic Drug Entry Prior To Patent Expiration: An FTC Study* (2002)

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## **EXHIBIT C**

### **STATEMENT OF PUBLICATIONS, PRIOR TRIAL AND DEPOSITION TESTIMONY, & COMPENSATION**

#### **I. Publications**

My publications from the last 10 years are listed on my CV, which is attached as Exhibit A.

#### **II. Trial and Deposition Testimony**

Within the past four years, I have provided deposition testimony in *In re Mushroom Direct Purchaser Antitrust Litigation* on October 15, 2013; *It's My Party vs. Live Nation* on November 18, 2013; *Savant v. Crestron* on May 22, 2014; *Castro v. Sanofi* on May 6-9, 2014, September 5, 2014, and July 13, 2016; *Suture Express v. Cardinal Health*, May 5, 2015; *Louisiana Wholesale Drug v. Unimed Pharmaceuticals (Androgel case)* on October 14, 2016 and August 10, 2017; *GN Netcom v. Plantronics* on December 1-2, 2016; and *In re Lidoderm Antitrust Litigation* on June 6, 2017

Within the past four years, I have also testified at trial in *Retractable Technologies vs. Becton Dickinson*, on September 10-18, 2013. Other cases in which I have filed expert reports in the last four years are listed in my CV, which is attached as Exhibit A.

#### **III. Compensation**

I am being compensated at a rate of \$1150 per hour for my work on this case, and my consulting firm, Legal Economics LLC, is being compensated \$235-575 per hour for the work of my staff on this report.